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Important Pulpwood Development In Ontario

Government Completes Agreement With Pulpwood Supply Co., Ltd., Newly Formed Organization with Which Sensenbrenner and Alstead Interests Are Identified—Six Million Cords of Valuable Pulpwood Available.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 28, 1936.—An agreement has been completed by the Ontario Government with the Pulpwood Supply Company, Ltd., a new organization with which the Sensenbrenner and Alstead interests are identified, under which 6,000,000 cords of valuable pulpwood in a hitherto inaccessible watershed in the Long Lac district of the province, will be thrown open to continuous cutting operations. The Hon. Mitchell Hepburn, Premier of Ontario, states that the program of the company which provides the taking out of 100,000 cords during its first year of operations, with the attendant bush hire of 2200 men, will probably be increased to 300,000 cords in succeeding years, with a corresponding boost in the employment of labor. In order that all these activities may be carried out, the province will provide the avenues of transportation to and from the watershed. This will involve the construction of a dam at the northern end of Long Lac and the building of several canal routes, all for the purpose of diverting certain waters from their present northerly course into a southern flow, with an outlet on Lake Superior. The estimated cost of the project is $250,000 which will be charged against the company and spread over a period of twenty years. The government will rush surveys of the projected construction as rapidly as possible in order that there may be a minimum of delay in getting the company in operation. An agreement with the company has been ratified and provides that a certain fixed minimum of cords be cut each year. Failure to observe the minimum will mean that $50,000 guarantee which the company has posted, will be confiscated and cutting rights on the watershed passed along to someone else. The pulpwood cut from the great area will be exported to the United States for the manufacture of paper but not for newsprint purposes. An eventual total revenue of between $5,000,000 and $6,000,000 based on a charge of a dollar per cord will accrue to the province of Ontario from the company's cutting.

Great Lakes Future

C. H. Carlisle, of Toronto, who in June last assumed the presidency of the Great Lakes Paper Company, Fort William, Ont., paid his first visit in his official capacity to the mill recently and delivered an instructive address before the Fort William Chamber of Commerce in which he gave a review of events which had lead up to the organization of the new company and outlined the policy and principles which will guide the new concern in its future operations. He said that cooperation and absolute fairness would be the keynote of the activities of the company. At the same time he informed his hearers that there was little likelihood of the company securing a second newsprint machine in the near future at least, but that the capacity of the mill would be stepped up to a higher level through efficient operation and modernization of present equipment. Mr. Carlisle added that high profits had caused over-expansion in the paper industry and the capitalization of newsprint companies at the present time was "impossible." These things led to insolvency and then to receivership in many instances.

At a meeting of the bondholders of the Great Lakes Paper Co., Ltd., which was held in Toronto on December 22, the bonds represented totalled $615,020 which was considerably short of the required quorum of $3,000,000 and it was decided to adjourn until January 18, 1937. At the next meeting whatever number of bonds is represented will constitute a quorum and resolutions may be adopted binding on all bondholders. The purpose of the meeting is to defer interest due October 1, 1936, until July 2, 1938, and interest due April 1, 1937, until July 2, 1939. It is understood that the bondholders are in agreement with the proposals. Some holders may request at the January meeting that interest be paid on the deferred interest. President C. H. Carlisle informed the meeting that deferment of interest was necessary to allow increase of working capital and plant improvements which would reduce costs. The Rt. Hon. Arthur Meighen, chairman of the formerly active bondholders committee and one of the sponsors of the plan to take the company out of receivership, said that the improvement in the affairs of the company was chiefly due to the work and forethought of Mr. Carlisle. The Great Lakes Company, which is now being run to full capacity at Fort William, Ont., employs about 400 men with an annual payroll of $700,000.

Outlook for Hinde & Dauch

The Hinde & Dauch Paper Company of Canada, Ltd., Toronto, of which L. F. Winchell is vice president and

(Continued on page 16)

Chicago Paper Business Continues Broad Advance

Mill Representatives Report Plants Operating at Capacity, With Orders Booked Well Ahead—Margin of Profit, However, Affected by Higher Costs of Labor and Raw Materials—Improvement Shown in All Grades of Paper.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 28, 1936.—Despite counter attractions in the form of a remarkably resultful holiday season, Chicago paper jobbers and manufacturers representatives are finding that business is continuing its broad and basic advance. Sales representatives report mills filled to capacity with business booked a comfortable distance ahead but take away a part of the optimistic picture by pointing out the fact that prices of labor, pulp and rags are sufficiently high to wipe out any appreciable margin of profit.

Expanding on Wide Front

Nevertheless, the paper industry locally is expanding on a wide front. Recent leaders in local markets have been coated and uncoated books, number 4 sulphites blanks and bristols. They have followed the leadership provided by krafts and groundwoods until virtually the entire local market is sharing in the betterment. Fine papers in general consolidated gains made during the Fall months with consumer elements meeting price advances in vigorous style. Newsprint markets are reported as materially stronger, with the outlook even better for 1937. Boards held gains into new and improved ground. Waste papers were slightly less steady than last week though no actual market changes were reported. Certain grades such as old books, white shavings, krafts and kraft envelope cuttings were reported as in the best demand in the local market.

News of the Industry

The Rhinelander Paper Company, issuing optimistic statements concerning new mill improvements and business in general, has also issued two beautifully printed books of samples of Excellent Parchment and Laminite. The former is exhibited in a swatch booket showing examples of pastel shades and of multi-colored printing. The Laminite grades are translucent sheets reported to be unusually effective in window display advertising.

The former vice president and director of the Dixie-Vortex Company, W. J. Hamlin, has recently accepted a position as president of the Universal Paper Products Company, 140 South Dearborn street, a Chicago concern making a drinking cup known as "Veecup" of cone shaped design and with several new features. Mr. Hamlin, a pioneer in the drinking cup field, was formerly vice president of the Vortex Company prior to its merger with the Individual Drinking Cup Company some months ago. It is reported that Universal will merchandise the "Veecup" through its own establishment and through the usual jobbing channels.

Changes in the executive personnel of the Chicago offices of the Wausau Paper Mills Company have recently been announced. M. E. McGarry, for over eleven years identified with the Munising Paper Company, has recently been elected vice president in charge of sales of the Wausau organization and will maintain headquarters at 111 West Washington street. The mills at Wausau are reported as enlarged and improved to take care of increased production and a revamped and extended sales policy. E. H. Larkin, who has been vice president and sales manager of Wausau for the past year, returns to Chicago as vice president of the Bryant Paper Company, with offices in Chicago in the Daily News Building.

The Interstate Commerce Commission hearings on the Colombian Paper Company protest on rates into Wisconsin are of interest to the mills in this territory. The Colombian protest states that domestic rates on woodpulp to various points in official territory and Wisconsin are unduly prejudicial as compared with rates on imported woodpulp from the North Atlantic ports. Rail carriers and port groups defending the import woodpulp rates state that all-water competition through the St. Lawrence and the Great Lakes makes the rate necessary and that any change would divert shipping through these latter channels.

Changes in the executive personnel at Mead Sales Company offices in Chicago are expected after January 1 according to reports which indicate that A. H. Cochran, recently Pacific Coast representative for Dill & Collins, Wheelwright Paper and Mead Sales Company, is to make his headquarters in the Chicago offices after the first of the year. Mr. Cochran will continue to supervise the coast activities of the company, with Hugh Wallace, recently representing Mead in New York and Dayton, taking personal charge of the Far West territory. Mr. Wallace has had a number of years of experience with the Wheelwright, Dill & Collins and Mead products in the East and is expected to continue this exceptional work out of the San Francisco office.

Associations representing the manufacturing interests of Illinois as well as the wholesalers and jobbers are wondering if it will be possible to defray enactment of a conforming unemployment compensation insurance bill in Illinois until the United States Supreme Court acts on the constitutionality of the much debated title nine. Illinois is one of the now comparatively few States not to have enacted such a law within the required time limits. If the Federal Government does not enact an amendment extending the eligibility date for States it is possible that every effort will be made here to ask the Legislature to withhold any action until the matter is entirely settled. The Illinois Legislature goes into regular session on January 5 with prospects of an extremely interesting session ahead.

To Hear American Writing Petition Jan. 28

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., December 29, 1936.—The final step in the reorganization of the American Writing Paper Company, Inc., will probably be taken January 28 before the Federal District Court at Boston when the petition for confirmation of the plan will be heard before Hugh D. McClellan. Acceptances of the plan has been secured from the larger number of those interested including the following: Unsecured claims, $228,928 or 92 per cent; first mortgage bonds, $3,512,000 or over 68 per cent; and of owners of 46,849 shares or over 52 per cent of the number of shares outstanding excepting treasury stock. With the approval of the court the company will be able to obtain a large loan in which to modernize its plants and place it in a better position to compete with other paper manufacturers in the country.

Volume of Paper Sales Well Sustained In Boston

Demand for Various Standard Grades of Fine Paper Persistent—Position of Wrapping Paper Market Continues Favorable—Box Board Business Running Ahead of Last Year's Record—Binder Board Quotations are Advanced.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 28, 1936.—The volume of sales made by Boston paper jobbers was well maintained for the week, although there was somewhat less activity, at least in some quarters, seasonal and expected. One house handling both fine and wrapping paper expects to "wind up the year in a blaze of glory and be well over the established quota for 1936." Fine papers were in good demand, with box coverings moving in substantial volume. In the wrapping paper division favorable reports were made.

Sales of box board during December were in larger volume than expected with better business than a year ago. Orders for January shipment have been received, as well as requests to speed up delivery of orders previously placed. Prices are tending upward. Binder boards, standard grade, have advanced on the low side to $70.00 delivered New England points, compared with a range of $67.00 to $75.00, previously quoted. Solid layer chocolate board will be advanced to $72.50 a ton January 1, from the present price of $70.00. Sulphite pulp is reported as scarce.

Prices of paper stock continued firm, with a generally upward trend.

Paper Merchants Cost Finding

The Paper Merchants Cost Finding Committee periodically publishes for the guidance of paper merchants current average costs of specified commodities. Such current average costs include two components: (1) The current average cost of the commodity to the merchant. (2) The current average operating costs based upon national surveys of the National Paper Trade Association. The following report of such average costs for kraft, gummed tape and hard fiber twine, has been fairly effective in putting a bottom under the market:

1. Kraft—Based on Northern kraft @ 4.25 cwt. On any quantity the average gross cost is computed at $4.75 basis 30-lb. rolls. Super kraft $5.00; butcher's kraft $5.00. All other differentials computed as customary.

2. Gummed Tape—Under 16 bundles, per bundle $3.25 for 60 lb. 600 ft., $3.50 for 35 lb. 800 ft., and $2.50 for 35 lb. 500 ft.

3. Hard Fiber Twine—Based on current mill resale list prices. Less than 10 reels medium twisted Java, mill list plus 2 cents. Ten reels or over, mill list. All usual differentials computed as customary.

The above figures are designed as a reference guide for comparison with merchants' own figures and it is believed that for the average paper merchant sales made above such figures should show some net profit. Reference is made to "current mill resale list prices" because the committee is advised by a well known certified public accountant that correct cost accounting calls for the use of current replacement costs as a basis for figuring merchants' own gross costs rather than the actual cost of goods on hand when an advance is made by their source of supply. The figures are made available through the courtesy of the New England Paper Merchants Association.

The Paper Merchants Cost Finding Committee is composed of Harry J. Dowd, chairman, of the H. J. Dowd Company; F. Bendel Tracy, of the Fort Hill Paper Company; Robert M. Stone, of the Stone & Forsyth Company; Floyd H. Blackman, of the D. F. Munroe Company, and Samuel Ginsburg, of Ginsburg Bros., Inc.

The bulletin includes a note by John C. Hurd, who is secretary of the New England Paper Merchants Association, in regard to refunds, stating: "In connection with the filing of floor stock claims against the United States for refund on January 6, 1936 inventory and on processing taxes paid on 1933 inventory, and the filing of returns on the 'Windfall Tax' you are advised that the former is optional but the second compulsory. As this is a very technical subject it may be to your advantage to consult a C. P. A. who has satisfied us of his competence in his field, Mr. Harry Goodman, 31 Milk street, Boston."

News of the Industry

Knight, Allen & Clark, Inc., are pleased to announce that beginning with January, 1937, they have added the Atlantic line of the Eastern Manufacturing Company to their already very complete lines of printing papers. They anticipate that the lines they have already carried will greatly increase in business the coming year.

The Arnold Roberts Company is handling Sales Aid Cover, "the newest Collins Cover," made by the A. M. Collins Manufacturing Company, Philadelphia, Pa. This product is an ink embossed stock, with a rich appearance, made in beautiful colors, including orange, buff, blue, yellow, brown, green, red, French gray, and black.

Jacob Bloom & Co., of 124 Pearl street, this city, are to open an office at 32 Hampden street, Springfield, Mass., on January 4. They will be Springfield agents for Franconia Bond and Pinetree Index.

The Christmas Party of the McQuillen Associates of the Storrs & Bement Company, held at the offices of the firm Thursday was a gala affair. One of the features of the occasion was the distribution of cash gifts to employees of the concern by William N. Stetson, Jr., president of the company. An adaptation of "The Night Before Christmas" was recited to the company. Best wishes were received from Roger Vaughn, who was unable to be present. Refreshments were served. The committee was composed of Misses Mary Linton and Marie McNeil and Donald Richardson and Frank Anderson. Dancing was included in the festivities.

The Ireland & Taub Paper Company, Inc., held open house December 24 to twenty-six Boston printers, at which "a good time was had by all." James Ham, Joseph Kinniery and Albert Hahn were the hosts, with Andy Nestor greeting the printers and extending to them Joe Taub's good wishes. An exhibit of actual printers' specimens was on display. During the afternoon, paper and type were forgotten for good cheer.

Knight, Allen & Clark, Inc., entertained at a Christmas Party at their offices Thursday.

The Frank C. Meyer Company, Inc., paper box manufacturers, Lawrence, Mass., had a Christmas Party Wednesday, and M. B. Claff & Sons, Inc., of Randolph and Brockton, gave a Christmas Party Tuesday at the Brockton plant, both of which were attended by friends from Boston.

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Exports of Canadian Newsprint Paper Rising

During November 5,916,653 Cwts., Valued at $10,340,246 Were Shipped Abroad, Compared With 5,614,653 Cwts., Valued at $9,891,609 In October and 4,880,747 Cwts., Valued at $8,230,189 Exported In November, 1935.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 26, 1936.—While production of newsprint in Canadian mills was not as large as in October, exports of newsprint were larger, the total being 5,916,653 cwt., valued at $10,340,246, as compared with 5,614,653 cwt., valued at $9,891,609 in October, and 4,880,747 cwt., valued at $8,230,189 in November, 1935. For the eight months of the fiscal year to the end of November the exports amounted to 41,626,602 cwt., valued at $72,300,954, as compared with 35,194,347 cwt., valued at $59,893,305 in the same period last year. Of the November exports 4,671,122 cwt., valued at $8,283,250, went to the United States. The next largest purchasers were Australia with 453,881 cwt., valued at $846,849; China, with 121,330 cwt., valued at $142,733; Peru, with 112,372 cwt., valued at $158,693; United Kingdom, with 88,731 cwt., valued at $137,534; Japan, with 68,196 cwt., valued at $129,625; New Zealand, with 66,700 cwt., valued at $125,788; and British South Africa, with 63,377 cwt., valued at $106,118. Altogether the November exports of newsprint went to 34 different countries.

Total exports of woodpulp in November amounted to 1,303,899 cwt., valued at $2,735,750, as compared with 1,338,336 cwt., valued at $2,650,697 in November, 1935.

Anxiety About Rayon Supplies

The position with regard to world supplies of rayon pulp has been causing some anxiety in Great Britain during the past few months, according to *Canada's Weekly*, published in London. This paper says: "The position has been accentuated by the development of the transparent cellulose wrapping industry and even more by the sudden demand for huge quantities of staple fibre. Again, there have been constant efforts made to substitute wood pulp for cotton linters where that has been used as a basic raw material for viscose rayon. These efforts have been very largely successful and wood pulp is now used on a larger scale than before. Efforts have also been made to utilise wood pulp in the acetate industry and here, again, some measure of success has been achieved.

"The difficulty is that there is a world shortage of all types of bleached sulphite pulp for all purposes, including that of paper making. It is not always appreciated that the quality of pulp required by the rayon industry is a very high grade bleached sulphite which is only made by a limited number of companies. In fact, there are probably less than twenty mills in the whole world engaged on the production of true rayon pulp.

"It is questionable which country is the largest producer of rayon pulp. The matter lies between Canada, the United States, and Norway. In Canada, the outstanding producer, and probably the largest in the world, is the Canadian International Paper Company, with an output of 100,000 tons per annum. Another important Canadian producer is the Restigouche Pulp and Paper Company. It is understood that further plants are being erected in both Norway and Canada, the two countries from which the bulk of British rayon pulp requirements are obtained.

"With the exception of cotton linters for certain purposes, there is no raw material which more satisfactorily supplies the needs of the rayon producer than does the spruce tree. Time may come when there is an actual shortage of this wood. Meanwhile there is considerable danger of a temporary shortage of pulp derived therefrom. Happily the problem is being met in a sensible manner, and though it may be found that difficulties will arise in the next year or so, the position will right itself as soon as the new plants in course of erection are got into working order. The capacity will then be sufficient to meet the demands of an industry which has developed on an unbelievable scale and which, moreover, looks like continuing to develop in such a manner."

Pulp Situation in Japan

The Japanese demand for pulp, both rayon and paper pulp, has been very active during the last year or two. Domestic production has been far from adequate to meet this situation with the result that imports have been greatly stimulated, writes P. V. McLane, Acting Trade Commissioner for Canada in Kobe.

The great increase in pulp production in 1934—valued at 17,523,882 yen compared with 7,451,966 yen in 1933—was the outcome of the increased demand for finished paper products. This increased demand was particularly evident in the case of newsprint; newspapers increased the size of their editions and also issued many special editions.

The low output of domestic pulp suitable for manufacture into rayon is a matter of some concern to Japanese rayon producers. The estimated domestic production amounted to 15,000 tons in 1934. Figures from unofficial sources places production at 22,500 tons for 1935 and estimate a total of 30,000 tons for 1936. A great many production plans are being considered, but the fundamental lack of suitable raw material is certain to prove a stumbling block to even a partial satisfaction of the demand.

The possibility of production of rayon pulp in Manchuria has also received careful consideration with four companies either formed or in the process of formation for the purpose of exploiting Manchurian timber resources. This development is fraught with uncertainty, however, as the charters under which these companies are allowed to operate limit output to such an extent that profitable production is impossible. Suitability and accessibility of supplies of pulpwood have still to be determined. In effect also, the scarcity of suitable wood in Japan is limited to such a degree that production can be done only at the expense of paper pulp, of which production is inadequate.

Boards Must Show Country of Origin

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 28, 1936.—A report to the Department of Commerce from Commercial Attache Oliver B. North at Ottawa states that the following additional goods imported into Canada on and after January 1, 1937 will be required to be marked with a satisfactory indication of the country of origin;

Fibreboard, strawboard, sheathing and insulation manufactured wholly or in part of vegetable fiber.

Waxed paper in rolls or sheets, wrapped, banded, boxed or packaged specially for household use.

Watermarks on Novel Christmas Card

One of the most novel and interesting Christmas cards of the recent holiday season was sent out by W. C. Hamilton & Sons, paper manufacturers, of Miquon, Pa.

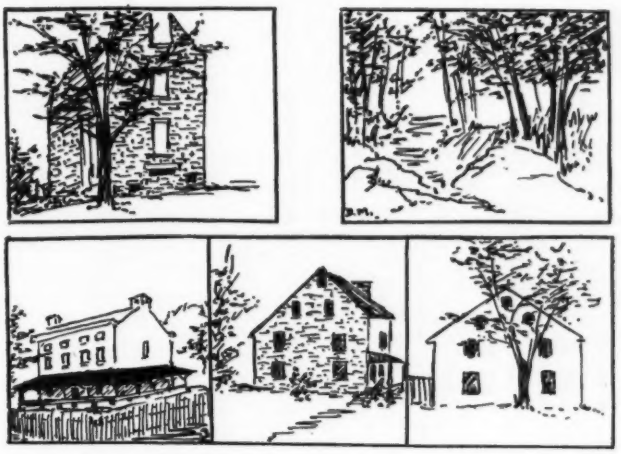
The card consists of a number of pen and ink sketches of early buildings on or near the Hamilton mill site, and reproductions of watermarks used at that mill by previous proprietors of the plant accompanied by historical notations. It is understood that the folder was prepared by James F. Magee, Jr., of Philadelphia, Pa., who for a long number of years has made a study of American watermarks.

At the top of the first page there appears the legend, "Christmas Greetings, 1936" and the explanation, "A study of the watermarks in paper, made in the Colonial paper mills located on Trout Run, Miquon, Montgomery County, Pa. The sites of these mills, (1747-1757) are today a portion of the W. C. Hamilton & Sons modern paper mills."

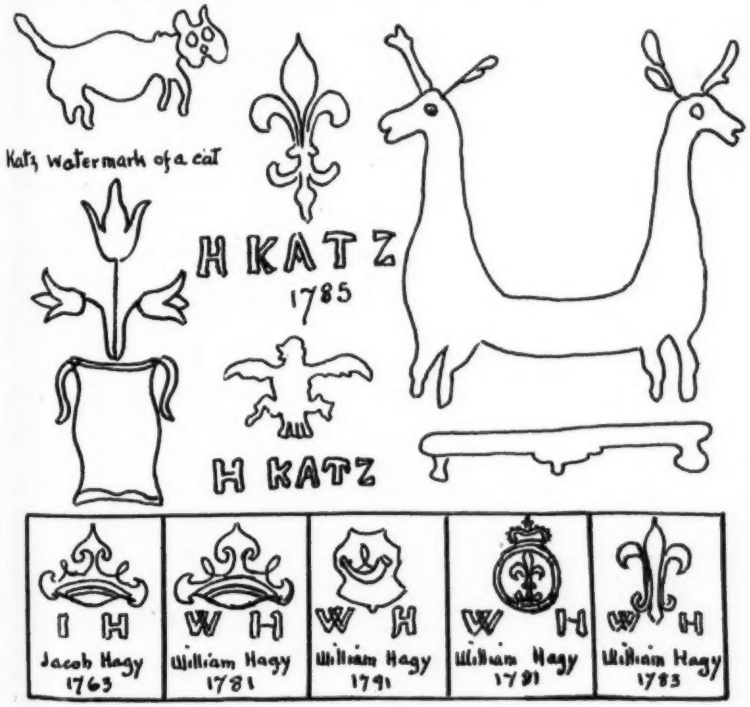
Accompanying this article are copies of the drawings which illustrate the little booklet.

Beside the watermark of an urn and tulips over the initials "H.K." is the notation: "The watermark of the Henry Katz paper mill. It appears in a letter written by Samuel Chase, signer of the Declaration of Independence, from Maryland, dated September 25, 1777. The design of the tulip is symbolic of the Trinity—Father, Son and Holy Ghost. The dower chest of a Mennonite bride was always decorated in the design of tulips and the linens that filled the chest bore the same design."

Page 2 carries an illustration of "the ruins of the Henry Katz mill. The original building was erected in 1757 by Nicholas Hassenbach, the first printer of Chestnut Hill. In 1760 Henry Katz purchased the paper mill and it remained in the Katz family until after 1812;" and another illustration showing where, "an Indian settlement was in a hollow among the hills above the Katz mill. A strata of very fine quartz appears on the surface. Here the Indians fashioned their arrowheads, axes and pestles to grind corn. Many of these implements are found in the neighborhood." On page 2 there is also a watermark of a crudely-drawn cat; one of a fleur-de-lis and one of an eagle under which is the name of the maker and the year date. Beside there is the note: "H. Katz' watermark of a cat in the paper of the Charming Forge, Bucks County, day book, May 1, 1775."



SCENES ABOUT PAPER MILL OF W. C. HAMILTON & SONS.



ILLUSTRATIONS OF EARLY WATERMARKS.

Page 3 has three reproductions of buildings and a datestone at the top, and at the bottom are five copies of watermarks. The wording on the page is as follows: "Superintendent's house (with picket fence around it) site of W. C. Hamilton and Sons. Site of the Anthony Newhouse (1746-1752) and Jacob and William Hagy (1752-1786) paper mill. Dwelling of Jacob and Mary Hagy (3 and 1-2 stories, with porch). The datestone of the building, on the site of an earlier house of 1749. The stone barn mentioned in a deed of 1752 (2 and 1-2 stories with tree in centre). Tradition states that Lafayette slept in this barn in May 1778 when the Americans were encamped at Barren Hill."

Just over the reproduction of the watermarks is the paragraph: "The W. C. Hamilton and Sons present paper mills and the Colonial Mills of Newhouse, Hagy and Henry Katz, are in historic Whitemarh Township. Early in 1683 Major Jasper Farmer, of Cork, Ireland, a personal friend of William Penn, purchased from the Proprietor, 5000 acres of land which formed the greater part of Whitemarh Township. This tract formerly belonged to the Umbilicanense Indians. In 1683 William Penn, on horseback, visited this Indian settlement."

Page 4 bears facsimiles of other watermarks, above which is printed "The Ham-

ilton and Newhouse-Hagy mills are located in the extreme southwestern part of this tract. (continuing from page 3). In 1746 Anth. Newhouse, a paper maker from Roxborough, purchased 54 acres of this land on the Schuylkill River. It started north of the line of Guilliemina Penn's Manor of Springfield. He built his paper mill before 1752 as in that year he sold the property to Jacob Hagy, a paper maker from Germantown. Here Jacob Hagy and his son, William, manufactured large quantities of fine grade hand laid paper. In historical letters of the Revolutionary period the Hagy watermarks frequently appear. The emblems used were the fleur-de-lis, the ancient hunting horn, the double-headed deer with the star, and the crown of George the Third."

PULPWOOD DEVELOPMENT IN ONTARIO

(Continued from page 11)

general manager, reports that advance in business during the past year has been very satisfactory and the company looks forward to another good period in 1937. The company will if possible, declare dividends to the amount of one dollar a share in the coming year, declares Mr. Winchell in a letter accompanying dividend cheques sent to shareholders. The current dividend is for twenty-five cents a share compared with the last payment of twelve and a half cents a share. As in the year 1935, Mr. Winchell says that further improvements were made to the producing facilities in 1936 and production went up accordingly. Close to 70,000 tons of paper board were produced this year, which was a gain of thirteen per cent and more than fifty per cent of this tonnage was fabricated by the company's own box factories. The largest improvement made was effected by the installation of a modern boiler in the paper board plant of the company at Trenton, Ont., which, it is expected, will make a considerable contribution to lower costs at that plant. During the first half of 1937 the company will completely revamp the refining systems in all mills which modernization when completed will give the company refining facilities second to none.

News of the Industry

D. McLeod, vice president of the Kenora Paper Mills, Kenora, Ont., who has not been enjoying good health, is spending the winter months in California.

The annual meeting of the Dryden Paper Company, Ltd., Dryden, Ont., which will be held on January 14, will be preceded by a special one of the shareholders to increase the number of directors from eight to nine.

The new office building of the Don Valley Paper Mills, Toronto, has been completed at Todmorden, Ont., where the headquarters now are. The company has had a successful year and recently equipment was increased by the installation of two, twelve hundred beaters designed for the output of high class papers.

William Race Is Made Treasurer

KALAMAZOO, Mich., Dec. 28, 1936.—At a meeting of the board of directors, William Race was elected to the office of treasurer of the Sutherland Paper Company.

Mr. Race succeeds Walter A. West, who resigned on account of ill health. Mr. West has no plans for the future except to take a rest to regain his health.

Mr. Race attended the University of London. He is a chartered accountant and was for several years employed by Deloitte, Plender, Griffiths and Company in London and Vienna.

Obituary

Abraham Price

Abraham Price, head of A. Price & Son, general paper merchants, of Brooklyn and Manhattan, died last Sunday of pneumonia at his home, 1299 Carroll Street, Brooklyn, at the age of 72.

Surviving are his widow, Agnes, and five children, Hyman Price, Mrs. Michael Margolies, Mrs. George Wedees and Miss Gertrude C. Price.

Mr. Price, who established his paper business in 1889, had been prominent in several philanthropic and educational institutions in Brooklyn.

He was president of the Hebrew National Schools, a founder and former honorary secretary of the Brooklyn Jewish Center and a former president of the board of directors of Beth Moses Hospital, at 404 Hart Street.

He had also been president of the School of Biblical Instruction and of the Hebrew Free Burial Society.

Howard L. Kneeland

BATTLE CREEK, Mich., December 28, 1936.—Howard L. Kneeland, aged 69, vice president of the Michigan Carton Company, and former merchant, died suddenly in his home Monday from a heart attack. He had been a director of the carton company thirty years.

Mr. Kneeland was a native son of Battle Creek. Upon leaving high school he entered the employ of the Old Advance Thresher Company, but later engaged with Thomas H. Butcher in the haberdashery establishment of Butcher & Kneeland.

He next became active in the Malta Vita Company, a breakfast food concern, and then was associated with the late W. I. Fell in the Michigan Carton Company. He served as alderman and later city commissioner.

Two daughters survive, both the wives of U. S. Army officers, Mrs. Arthur Zeigler, of Honolulu, and Mrs. James Zeigler, Fort Knox, Ky.

A. R. Graustein Tells of Old Suit

[FROM OUR REGULAR CORRESPONDENT]

AUGUSTA, Me., December 28, 1936.—Archibald R. Graustein, former president of the International Paper Company, testified he spent 10 years seeking settlement from the Central Maine Power Company for damage to the paper company's Ram island dam site in the Androscoggin river above Lewiston.

Principal witness in International's $500,000 suit against the power company, Mr. Graustein testified that settlement, "like prosperity, seemed to be just about the corner but we didn't seem to get to it."

The paper company's suit asserts its dam site was "flowed out" and ruined by construction of the utility Guf island dam 13 miles downstream in 1926. The company completed its testimony today.

Mr. Graustein, now a New York lawyer, testified that Martin Insull, representing the Middle West Utilities Company, once accompanied Walter S. Wyman, president of Central Maine, to his New York office and indicated their willingness to settle on a basis of carrying charges and costs of the dam site to the paper company.

Mr. Graustein was examined by former Gov. Joseph B. Ely of Massachusetts, attorney for the paper company. Other witnesses were Chester S. Colson of Scarsdale, N. Y., L. H. Mann and Harry M. Nelson of Waban, Mass., engineers for the paper company.

Large "Y" and Reducer Section for Water Supply Line Fabricated by New Method

By F. G. Sherbondy[1]

The large "Y" and reducer section, weighing 32,870 pounds and fabricated entirely of steel, arc welded to a design requiring unusual reinforcements, was recently completed by The Biggs Boiler Works Company, Akron, Ohio, and installed in an industrial plant at Dearborn, for a main mill water supply line.

This large "Y", (Fig. 1), has an overall length of 20 feet 4½ inches and a diameter ranging between 54 and 60 inches. The "Y" is designed for arc welded steel construction, replacing cast iron. It provides good hydraulic characteristics, permits desirable flexibility of design to accommodate unusual conditions of installation, insures maximum safety against rupture in service, and provides the required structural strength to resist water hammer and over burden.

Construction of the "Y" utilizes ½-inch steel plate with all seams electrically butt welded. A total of 600 feet of welding was required. This was all done by the shielded arc process with equipment supplied by The Lincoln Electric Company, Cleveland, Ohio.

[1] Vice President, The Biggs Boiler Works Co., Akron, Ohio.

FIG. 1.
Large "Y" and reducer section of arc welded steel construction, fabricated by the Biggs Boiler Works Co., Akron, Ohio, for a Dearborn, Mich., industrial plant.

FIG. 2.
The large "Y" being fabricated by the shielded arc process of electric welding at the Biggs Boiler Works Co., Akron, Ohio.

The design of the "Y" embodies unusual reinforcements. These can be seen in Figs. 1 and 2. The method and computation of the shell reinforcement follows.

Considering Section A-A, (Fig. 3), it is observed that the design of the 60-inch 30-degree lateral will be statically correct when: First, the thickness of the shell is equal to the thickness required for an ordinary pipe; second, when the tangential tension components of "T", or their resultant "R", are taken care of by a suitable reinforcement at point "X". As these loads "R" occur along line "a"-"a", (see Fig. 4), the most economical reinforcement will be a horseshoe beam along "a"-"a". For larger laterals such as this, it will be more economical to

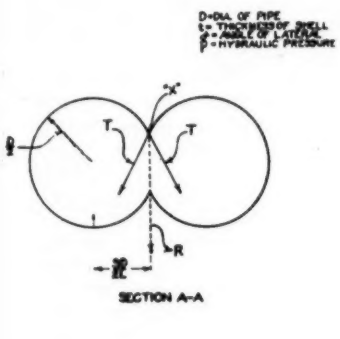


FIG. 3.

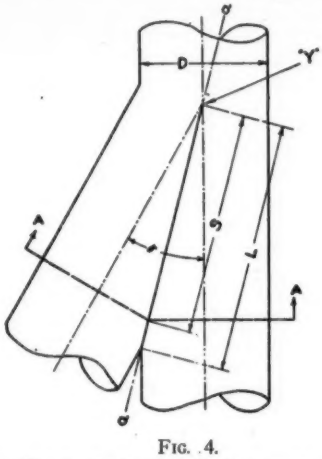


FIG. 4.

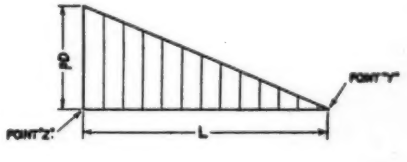


FIG. 5.

FIG. 3. Design detail of arc welded steel lateral. Fig. 4. Loads "R" of lateral occur along line "a"—"a". Fig. 5. Triangular shape which represents the loading of the 60-inch 30-degree lateral.

support the heels (at point "Y") with a ring support at "Y", or with a tension member through the pipe at "Y". Referring to Fig 4, the computation of the shell reinforcement is:

$$T = \frac{pD}{2} \text{ per unit length}$$

$$R = \frac{2T}{\frac{SD}{2L}} \times \frac{1}{D/2} = \frac{2TS}{L} = \frac{pDS}{L} \text{ per unit length}$$

This means that the loading is of a triangular shape (Fig. 5). The computed stress of the reinforcing horseshoe is 14,000 lbs. per sq. in. for a working pressure of 90 lbs. per sq. in.

In constructing the "Y", all parts were first cut to proper size, then rolled and pressed to correct shape and contour. The parts were then tack welded together for assembly. Welding was done in multiple beads, by the "step-back" method of welding; that is, the welds were made in short lengths at alternate points along the seam. This method prevented accumulation of stresses and distortion. The completed structure was not thermally stress relieved but to aid in reducing stresses, peening was used on all welds. To insure conformity with the procedure control followed by builder, specimens were cut and tested at intervals. Following final welding, done with ¼-inch and 5/16-inch "Fleetweld" shielded arc type electrodes and "Stable-Arc" welders manufactured by The Lincoln Electric Company, the section was tested under 250 lbs, hydrostatic pressure. No leaks were found and no rewelding was required.

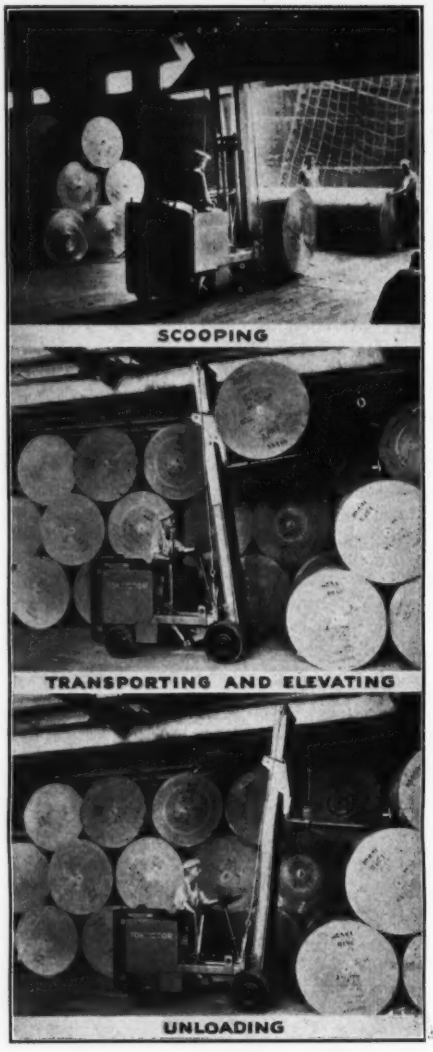
Considerable savings in weight, materials and time were permitted by use of arc welded plate construction. Weight was kept at a minimum since in arc welded steel no connecting members are needed (as in riveted construction) and no excess material is needed (as in cast construction) to obtain necessary strength and rigidity. Electric welding by the shielded arc process obtains, in the welded joints, strength, ductility and other physical properties equal to or better than the parent steel. This high quality joint metal, plus the fact that welding eliminates punches and drilling and pattern making, makes arc welded steel construction an excellent method of producing a structure such as the "Y" illustrated and described.

Towmotor Lift Truck for Paper Handling

Towmotor, Inc., pioneer in the building of straight gas powered industrial haulage equipment since 1919, now offers a new high mast lift truck especially designed for handling paper in rolls, and stacking to a greater height, thus economizing floor space.

A scoop is used instead of forks to avoid injuring the paper, and in operating it, the forward edge is lowered to the floor with the mast tilted slightly forward. The truck forces the scoop partly under the roll and a quick backward tilting of the mast scoops the roll back into the carriage where the roll holds itself without additional clamping. Traveling is done with the load in the lowered position.

Approaching the pile, the load is partially elevated, and when the truck has swung into position, the load is lifted sufficiently to attain the desired height. Then a quick forward tilting of the mast puts the roll in place. The whole operation is accomplished without the driver leaving his seat or requiring the assistance of the men on the floor or on the pile. The mast is tilted backward as quickly as the load in picked up and elevated in this position at destination. When the mast is tilted forward for unloading, it will not tip over, as the paper quickly rolls off the scoop.



Like other Towmotor Lift Trucks, the new model described and illustrated here is fast and economical in operation. Its hydraulic method of lifting and tilting gives it a steady, smooth performance. It carries its load over the driving wheels for better traction, while the rear steering permits short pivot turns in close quarters. Its high speed in reverse permits faster travel in both directions and the operator is seated on top of the machine for comfort, safety and better vision. The overall height, the lift and the capacity may be governed to suit individual requirements. It is manufactured by Towmotor, Inc., 1220 East 152nd street, Cleveland, Ohio.

Make Cigarette Paper in Shanghai

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1936.—Cigarette paper is now being produced by one of the mills in the Shanghai district to the amount of 422,000 rolls annually, according to a report to the Department of Commerce from American Consul C. E. Gauss, at Shanghai. The report states that this paper is being consumed by cigarette manufacturing plants in China.

Technical Control As Viewed by The Management*

By George Sisson[1]

It is a distinct privilege to participate with the technical men of our industry in the consideration of matters which are fundamental to the success of our business.

We are engaged in a great and dignified industry, recognized as one that is indispensable in human affairs. We have a right to be proud of our industry, and the progress it has made, but we have no right to be satisfied with its present status or to be content with things as they are.

Progress and improvement must be our watchwords, and in that endeavor lies the great field for the work of the engineer, the chemist, the technician, in all branches. His fundamental research and the development of instrumentation for control of processes, must be so correlated with management that practical results are assured. This is a basic fact and an indispensable prerequisite to the success and continuity of our industry.

I spoke earlier of the place which the paper industry holds in human affairs. From time immemorial man has sought methods of expression and communication. Vocal sounds indicative of hunger, fear, anger or love gradually evolve into speech understandable in various groups and thus, doubtless, language had its birth.

But communication by word of mouth had its limitations in both time and space. Men's thoughts, men's visions, their triumphs, the records of their heroes, their very aspirations, may at first have been chronicled in crudely drawn pictures. The very nature about them in sky and sea, on land and in forest, called to the early man to leave some record, perhaps on stone or clay tablets, symbolic characters as significant as our ABC's, and so writing was evolved. Development of the recorded word, whether carved on stone or clay, painfully etched on metal or vellum or printed on various types of what we call paper, has paralleled the development of civilization.

The invention of writing and printing and the use of paper therewith have had greater influence in uplifting the human race than any other intellectual achievement in the career of man. It has been more important than all the battles that were ever fought and all the constitutions that were ever devised.

For such accomplishment, honor and recognition must be given to the men who, by patient research and the application of sound technique in practice, have contributed to this great achievement.

The truly brainy man pursues his problems with an open mind, receiving, considering, and putting to the test of practical experience the propositions that come to him.

We have no moral right to decide on a basis of opinion that which can be determined as a matter of fact. This is the ground for unbiased research in all departments of life where desire to back up an opinion is not and should not be the underlying motive. Therefore, I say, all honor to the man of research who, with open mind, with no preconceived views and theories of his own to protect, patiently pursues his search for facts.

Back of all man's accomplishment in every field which serves civilization has been patient research and by it we can measure the progress of the mind of man through the ages of superstition and ignorance to the age of reason, where the hidden forces of nature were no longer feared, but were gradually unfolded to man's persistent search and made to serve his purposes.

The modern industrialist is the foster father of research. It is his responsibility to put into service today the discoveries which have awaited the ripened time. In these modern times, the creative mind implemented with the equipment for scientific adventures has worked with and against the powers of earth, air, fire and water, and made nature more fertile, industry more productive, and life more abundant.

You technical men are working in a rich and inviting field for the exercise of man's creative instinct. That impulse is what spurs you on in your research. It is man's greatest gift, for all creative power ultimately proceeds from the free spirit of the individual for which the world has never invented any successful substitute in political institutions, industrial organizations, or economic systems, whether devised or conducted by saints, scientists, soldiers, or statesmen.

The modern industrialist is moving among forces that he increasingly controls. He is able to do this because of the work of you technical men in the various industries. In our own and other industries, he first became absorbed in making useful things quickly and cheaply by mass production and soon seemed to forget beauty. Now he begnis to show eagerness to have the place in which he works and the things he makes more beautiful. He is calling beauty back from the far country to which she seemed to have been banished, and soon, we hope, will be calling back the things of the spirit. For these too have a place in our industrial picture. This is well illustrated in the present trend and development of the many attractive specialties on the production of which the future of paper making in New York State must depend.

In our own and other industries, art has been wedded to industry at the end of an uncertain companionate period. I predict the union will be a happy and permanent one, for they can never be divorced on the grounds of incompatibility, for beauty and utility are not incompatible. Each supplements and complements the other—a perfect union.

This machine age in which we live and which has been much criticized by those who do not know it intimately, need not be a crude and uncouth era; it can be shot through with truly scientific idealism. I was convinced of this when talking once with that great scientist, Michael Pupin. We were speaking of the manner in which some noted European writers criticized machine civilization as an "American plague invading Europe and threatening to undermine its ancient culture." Pupin denied that these European critics of our civilization were qualified to interpret the real meaning of the American machine or of any other machine.

His book, a little volume entitled "The Romance of the

* Presented at the meeting of the New York State Group of the Technical Association of the Pulp and Paper Industry, Watertown, N. Y., Nov. 14, 1936.

[1] President, Racquette River Paper Company, Potsdam, N. Y.

Machine," will enlarge the vision and elevate the spirit of every true craftsman.

To personify the machine, we might hear it saying: "I know my function; 'tis to emancipate man; to conserve and extend his strength; to release him from drudgery so that he may know his divinity and learn to love work and enjoy leisure; to develop his constructive power; to help man conquer the earth and subdue it so that this world may be filled with happy, healthy, creative men and women and with welcomed, joyous children. To all this service of man, my Master, I, the machine, the fruit of his spirit, eagerly aspire and gladly give myself, so that he who made me shall also know me as his proud, humble, devoted, serviceable friend."

With that ideal of our so-called machine civilization before us, 'tis our privilege to make it true in the best human sense of social responsibility, working together with sound technical research can make it true.

We cannot over-emphasize the value and necessity of combining scientific or technical analysis with practical experience and judgment of industrial and business executives, who have spent many years dealing with specific concrete problems of management in their own enterprises. But neither academic economic investigation and analysis nor practical business experience can stand alone and separate in face of the complex problems arising in the rapid development of our modern industrial system. For successful practical procedure in problems of industrial management in any industry, and for sound public policies affecting industry, a combination of both these elements is necessary.

These observations emphasize the necessity for closer cooperation of all elements in American industry as a whole, for intelligent management and control of its own affairs; and this must be done in the light of the recognized social responsibility of industry.

I believe in the supreme importance of knowledge of facts and the understanding of their significance by industry, legislators and the public, in the hope that honest efforts to ascertain facts, interpret their meaning, and promote general understanding of them will ultimately lead to sound private and public policies. This belief is based on the principle that the advancement, expansion and effective operation of the productive industries of the nation are the primary and indispensable condition of social welfare and national progress.

In so far as you in your field of research and technical development, and we in the application of these principles in the actual processes of our industry, carry on in the spirit I have indicated, we are bound to make a distinct contribution to our time.

And such, my friends, are the thoughts which this occasion brings to me, an humble paper-making craftsman who, with others of that craft, is privileged to be present tonight.

We are collaborators with you in the high task of human service through our closely related activities. We, like you, are filled with enthusiasm for our paper industry and are constantly striving toward an ideal which may be elusive, but seems very real to us.

Reforestation*

By F. G. Kilp[1]

What a big job it turns out to be for the average forester and little does he realize, to begin with, how important a part Old Mother Nature plays in branding his yearly work a success or failure. If she smiles on him with big raindrops, everything is lovely, but if she frowns on him with drought, the year's accomplishments are unsatisfactory. A craftsman can be thankful for his confinement since the roof he works under and the walls he works within provide him with a certain amount of control over his working conditions. Such is not the case with the forester; he must face the elements and remain at their mercy during all seasons of the year. For example, during an early spring season the Wisconsin River at Port Edwards may have a flow of 50,000 cubic feet per second, and in July of the same year it may drop to 800 cubic feet. During February of the same year a week's temperature ranging from 30 to 40 degrees below zero may be recorded; perhaps in July of this same year a week ranging from 103 to 115 degrees above in the shade may be recorded and surface ground temperatures as high as 165 degrees with humidities as low as 5 per cent. During this entire week the weatherman may be predicting rain. Yes, and then to top it off, a cigarette smoker carelessly drops a lighted match in a pine plantation while picking blueberries.

It has occurred to me time and again that our general manager must find it rather difficult at times to convince an old gray-haired director, interested in dividends, that the Nekoosa-Edwards Paper Company forestry program is sound and very essential in order to guarantee future earnings. Yet, that is the truth, and one material cost item alone may help to clear up this statement. Nepco's yearly freight bill on pulpwood hauled by rail to its Nekoosa mill varies from 10 to 12 times more than it costs to acquire 2,500 acres annually of fully stocked pine reproduction—both natural and artificial—within a 5 to 15 mile radius of its mills' smokestacks, all other forestry costs included.

Since 1925 just 67 acres of Nekoosa-Edwards Paper Company forest land have burned over, and of this amount, approximately 15 acres can be classified as planted forest and 20 acres as natural reproduction forest, the balance being unimproved brushland. This burned acreage amounts to 0.3 per cent and represents a $150.00 loss in dollars and cents. We feel proud of this 12 year record.

There was a time, not long ago, when paper and pulp mill management had good reason to hesitate before embarking on a reforestation program because of the forest fire danger. The fire risk in most of Wisconsin's forest section today has radically changed and is now such that it does not appear logical to state in one breath "Let the State and Federal Government do the reforesting," and then in another breath criticize the government for spending money to insure a future pulpwood supply. If private capital wishes government to stay out of this business, it must enter. There is plenty of room for both. If we are to meet Southern competition (especially in the kraft industry) and live on into the future, it means we must pay more attention to our raw product supply both as to its location and quality. Paper and pulp mills the size of our Nekoosa mill, requiring the entire forest growth off 10,000 acres annually, cannot safely depend much longer upon

* Presented at the meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry, Appleton, Wis., Oct. 13, 1936.

[1] Forester, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

the open market for the quantities and quality of pulpwood that are necessary to insure a good manufactured product and at the same time remain within a radius of reasonable transportation costs.

Some mills are not well located in relationship to their raw product supply. These mills will always find it difficult during times like we have just experienced to remain on the profit side of the ledger because a cheap raw product is then found to be very essential. Mills which are well located will find it very profitable in the near future to be in possession of a forest property, especially if it is within a trucking distance of its wood yard. A young growing forest is by far the most profitable long term investment. Forest lands supporting such growth can in many instances be acquired for extremely low prices per acre. These lands may be as much as 90 per cent fully stocked with desirable pulpwood species, requiring very small planting expenditures to put them in a 100 per cent stocked condition. The Nekoosa-Edwards Paper Company has not found it practical to buy and plant totally barren land to pulpwood species, and it is not the company's policy to spend its forestry money in that manner. Barren lands are acquired only when it is found necessary to blockout a forest property.

Plantations

Most planting is done in shallow furrows today, not over 5 inches deep. We have learned after 11 years of experience that it is best to plow the furrows north and south and plant on the west side of the furrow in order to protect the seedlings or transplants from the prevailing west winds. We have also decided it is best to space the trees 4 feet by 4 feet in open fields or denuded areas and to use strong vigorous seedlings or transplants at least 2 years old (3 and 4 year plants are still better if available). The important thing in planting is to space the trees close enough together to kill out the competitive root growth at an early date and thus create a good forest growing condition as soon as possible. The last few dry years have proved this conclusion to be sound and logical.

Up to this date we have not had much success with direct seeding methods. Perhaps the hunter weighs the injustice of the hawk too heavily, and by so doing, the field mice multiply too rapidly and defeat our aims. By actual count on a sample plot, we have caught as many as 24 mice in 25 traps in one night. These experiments were carried out in a fall furrowed area. The net result the following June was ten seedlings without a chance to blame the poor showing to drought which soon followed. Today we depend entirely upon tree planting to place a barren area in fully stocked conditions. In areas where we have an abundance of seed trees (especially jack pine) and where conditions are favorable, we depend entirely upon natural regeneration methods and they seldom fail in normal years. In some of the places where we have scalped for planting purposes, we find today, in addition to the trees we planted, as many as six that were planted by nature. We have become firm believers in this phrase: "Give nature a chance and she will produce in most every case, but back her up with good fire protection."

Again we have learned from experience that all plantation areas should be thoroughly examined and the soil properly analyzed before deciding what trees to plant because money and time can be wasted if the wrong species are used. The droughts during the past six years seem to have proven this statement correct.

Nursery stock for planting purposes can be raised cheaply and it is surprising what a small amount of this stock is necessary if the right type of forest land is selected. Planting costs, including trees, ought not to exceed $6.50 per acre in Wood County's sandy pine soil regions.

Growth studies in our older plantations indicate we can produce merchantable pulpwood within 35 years from planting date. In many of our natural reproduction forest areas it now appears we can start cutting within 10 years from this date.

Fire Protection

Between 1926 and 1930 we were practically alone in the field of fire protection, and today we must protect twice the acreage we own in order to fully protect our own acreage. Please bear in mind that of the 11 years the Nekoosa-Edwards Paper Company has been practicing forestry, 5 years have been drought years and a few of them will long be remembered. In the face of these adverse conditions only 0.3 per cent of the entire acreage owned has burned over and 28 fires were suppressed within the company's forest tract, the average burn being less than 3 acres per fire. Four fires alone accounted for a total of 50 acres and the balance, or 24 fires, for 17 acres. These figures indicate there are many traces of optimism hidden within a private reforestation project.

Fire brakes or roads have been constructed around every half mile block of forest land, thus making our entire forest area accessible to within one quarter of a mile. These roads can be travelled with all types of forest fire equipment and cost approximately $100 per mile to build. Maintenance costs are very reasonable, providing the right type of equipment is used.

Timber Stand Improvement

We now have an employee's wood cutting permit system in effect that allows us to carry out a certain amount of cheap cultural work within our forest properties. During the past five years we sometimes had as many as 200 shift workers cutting fuelwood on their own initiative. They produce as much as 3,800 cords of fuelwood and improved 400 acres of young timber growth in one year. All limbs and brush not used for fuelwood must be burned and stumps cut to within 3 inches of the ground. A park condition in our young pine forests is the final result of their efforts with but little cost other than marking trees to be removed and supervising their work. This type of work begins about November 1st of each year and extends through to April 1st of the following year. There now seems to be a keen desire on the part of most employees to cut their own fuelwood and we encourage them in every way possible.

SALES WELL SUSTAINED IN BOSTON

(Continued from page 13)

Albert E. Temple, formerly for 22 years with the Merrimac Paper Company, Lawrence, Mass., is now associated with Percy D. Wells.

A third daughter was born December 16 to Mr. and Mrs. Richard F. Piper. Mr. Piper is a salesman for the Baird & Bartlett Company.

Clarence A. Wiswall, a former paper box manufacturer of Wakefield, Mass., will leave shortly for West Palm Beach, Fla., and Archer H. Fownes, head of the Fownes Manufacturing Company, paper boxes, is to go to Orlando Beach, Fla., January 5.

Leslie M. Gooder, of the Wrenn Paper Company, Middletown, Ohio, spoke recently before the Advertising Club of Boston on newspaper advertising.

Albert E. Sawler, trade association officer of the Dennison Manufacturing Company, Framingham, Mass., spoke recently before the New England Council of the Controllers' Institute of America, discussing the Robinson-Patman Act, at the Boston City Club.

Paper Industry Sets Goal of $400,000

Subscriptions totaling $400,000 have been agreed upon as the goal of the Committee of the Paper Industry, organized to distribute the New York World's Fair Four Per Cent Debentures, Bernard J. May of the J. E. Linde Paper Company, chairman, has announced.

Plans for canvassing the industry were completed at a meeting of the committee on December 15 held at the headquarters of the New York World's Fair Bond Sales Committee. The goal was agreed upon at that time, the opinion being expressed that the World's Fair would increase the business of paper merchants and mills in New York to the extent of $9,000,000 if the Fair lasts one year or $13,950,000 if the Fair is extended to a two year period. On the basis of these calculations, it was pointed out that the total subscriptions which are being sought in the paper industry will represent less than one-half of one per cent of the expected gain in business.

The paper committee is one of seventy similar volunteer groups, including more than 1,600 business men, which have been organized to canvass trades and industries for the purchase of the Fair debentures. The issue will total $27,829,500 and will provide the funds needed to defray the expenses of the Fair Corporation prior to its opening April 30, 1939.

Four additional paper men have joined the original group of thirteen volunteering their services in the campaign. The new committee members include Frederick Beetson of the Rochester Paper Company; E. R. Lyman of the Missisquoi Corporation; Max Reinhold of the Reinhold Card and Paper Company, and C. Slicklen of Charles F. Hubbs & Co.

Among the members of the committee previously announced are Samuel T. Baron of the Royal Card and Paper Company; Butler Cox of the Wheelwright Paper Company; P. W. Eason of the Lathrop Paper Company Inc.; Allen Horton of W. C. Hamilton & Sons; Charles W. Knode of the Charles W. Knode Company, representing the Chillicothe Paper Company, the Hawthorne Paper Company, the Appleton Coated Paper Company, and the Michigan Paper Company; W. McGilpin of the Strathmore Paper Company; Bernard J. May of the J. E. Linde Paper Company, chairman; Franklin Miles of the Crocker-McElwain Company; M. Pomerance of the Forest Papare Company Inc.; Robert M. Robert of the Robert Paper Company; Fred Schlosser of the Schlosser Paper Corporation; Robert Schmidt of the Miller & Wright Paper Company; and D. J. Werner of Henry Lindenmeyr & Sons.

S. Morgan Smith Co. Bulletin

The S. Morgan Smith Company, with general offices and factories at York, Pa., has issued a bulletin showing some extremely interesting pictures of the work the company has been doing on the Bonneville Dam, the U. S. Government's great project on the Columbia River, near Portland, Ore. The units installed are noteworthy because they are the largest of their type ever built in the United States, measuring 48 feet, 5 inches from the bottom of the runner deflector to the generator coupling, and with shafts 39 inches in diameter. They are also the highest powered Kaplan turbines ever produced anywhere. The bulletin also points out why and how the S. Morgan Smith Company is today able to meet with any and every demand of modern business in its particular field.

Estate of Late Charles Seybold

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, December 28, 1936—Inventory and apprisal of the estate of the late Charles Seybold, of the Seybold Machine Company, now part of the Harris-Seybold-Potter Company, manufacturers of paper cutting machines and other equipment used in paper mills and printing plants, was filed the past week in the Probate court of Montgomery county. The personal property is valued at $1 and other property and securities at $35,700.

It is understood that Mr. Seybold disposed of his large estate some time before his death. It is believed to have been valued at several millions of dollars.

In the inventory filed with Probate Judge William C. Wiseman, Dayton, there is no real estate listed, and only four securities, including New York Central and St. Louis Railway preferred stock, $8,900; Harris-Seybold-Potter Company, common stock, $19,800; land trust certificates, Harries Building, Inc., First and Main streets, Dayton, $4,800; and a lease valued at $2,200.

Mr. Seybold died several months ago. He was recognized as one of the leading inventors and manufacturers of the Miami Valley. Coming to this country when a youth from Germany, he struggled for many years before achieving a success. An expert machine repair worker, he climbed from obscurity to success. His first great achievement was the invention and manufacture of an equipment for a Dayton paper mill, which decreased costs and increased capacity. This work was accomplished after several dismal failures and much arduous work, but it led to the establishment of the great machine industry which he built up in Dayton. At the time he was perfecting the paper making machine, he resided in Cincinnati and he made daily trips to Dayton, working mostly at night, while still conducting his modest machine repair shop in the Queen City.

After a long period of successful management of the Seybold plant in Dayton he merged his concern with the Harris-Potter interests, and this industry with headquarters in Cleveland, and branches in many of the larger cities of the country is now one of the largest of its kind in the United States.

Although during the past several years Mr. Seybold had not been active in the conduct of the amalgamated business, he was usually found at the Seybold plant in Edgemont, Dayton, supervising details in a leisurely way.

To Sell Norman Division Jan. 4

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., December 29, 1936.—The water rights, machinery and equipment of the Norman Division of the American Writing Paper Company, Inc., corner Appleton and Water streets in this city will be sold at public auction January 4 by Charles Proctor of North Grafton.

At the same time the property owned by the company at Windsor Locks, Conn., will also be sold including water rights and real estate. The mill itself and buildings of the Windsor Division at Windsor Locks was torn down some time ago and the business of that mill transferred to Holyoke.

The Norman mill sale will include the mill buildings with elevators and sprinkler systems, the power plant comprising two Babcock & Wilcox boilers of a rated 880 hp. Corliss engine for auxiliary power rated at 380 hp., water rights of 600 hp. and maximum of 800 hp.; other machinery and equipment as rotary boilers, iron and wood tub washers, pulper, supercalenders, Findlay cutters, Clark cutter, undercut trimmers, embossing machine, and other minor machinery.

Noble and Breyfogle Entertain

KALAMAZOO, Mich., December 28, 1936—The annual New Year Dinner Dance given by Chas. H. Noble of the Staley Sales Corporation and L. H. Breyfogle of the Draper Felt Company, was held in the main dining room of the Park American Hotel on Saturday evening, December 26 at 9 P. M.

This is easily the outstanding social event among the many sponsored by the different groups included in the paper industry of the Kalamazoo Valley.

The arriving guests were graciously greeted by Messrs. Noble and Breyfogle assisted by their wives. From tastily arranged tables, laden with aperitifs and a flowing punch bowl, the ladies and gentlemen were regaled before the serving of the dinner. During the dinner an orchestra and vocal talent furnished entertainment. Dancing followed until a late hour. Among the many present the following were noted:

Mr. and Mrs. Arthur Cole, Miss Irene Cole, Arthur Van Ernst, Pauline Little, Eddie Cowling, Mr. and Mrs. Paul Dumas, Mr. and Mrs. Olin W. Callighan, Frank Brown, Miss Frances Noble, Frank Noble, Chas. Noble, Jr., Evelyn Noble, Russell Gould, Stella Boers, Mr. and Mrs. L. L. Griffiths, Jr., Mr. and Mrs. Jacob Boot, Mr. and Mrs. Frank Eilers, all of Kalamazoo, Mich.; Mr. and Mrs. Ray Barton, Plainwell, Mich.; Mr. and Mrs. Newsbaume, Three Rivers, Mich.; Mr. and Mrs. Otto Fisher, Mr. and Mrs. A. L. Sherwood, Mr. and Mrs. Norman J. Cowie, Mr. and Mrs. C. H. Noble, Mr. and Mrs. L. H. Breyfogle, Homer Stafford, Miss Helen Redmond, Michael Redmond and Robert Stewart, of Kalamazoo, Mich.; Mr. and Mrs. J. M. Jacquish, New York City; Mr. and Mrs. Arthur Ritzell and Mr. and Mrs. Earl Bernard, of Morris, Ill.

To Hear Pacific States Paper Case

WASHINGTON, D. C., December 30, 1936.—Further hearing is to be held in the Ninth Circuit Court on January 11 in connection with the case of the Federal Trade Commission against the Pacific States Paper Trade Association and others. This is the long drawn out case which has been pending for several years.

In accordance with permission granted by the Ninth Circuit Court the several respondents filed a number of motions and pleadings with that court including a motion to strike certain portions of the Commission's petition, a motion to dismiss the petition, a demand for a bill of particulars and demurrers.

The Court has directed that the return to the order to show cause and hearing of the several motions be continued to January 11.

It may be recalled that the court proceeding in this case was instituted by the Trade Commission on May 21, 1936, when it filed its petition for a rule requiring the several respondents to show cause why they should not be adjudged in contempt of Court for having disobeyed a decree of May 2, 1927, affirming the Commission's cease and desist order directed against price fixing agreements in the sale of paper and paper products in interstate commerce.

Palmieri-Kramer Nuptials

The marriage is announced of Anita Elvira Palmieri, daughter of Mr. and Mrs. Dominick Palmieri, of St. Albans, L. I., N. Y., to Milton Kramer, president and treasurer of the Palmieri-Kramer Corporation, 274-6 Flushing avenue, Brooklyn, N. Y., who within the last three months have established a paper stock business at that address. Mr. Kramer is the son of the late Gottfried Walter Kramer who was connected with the Marvlo Mills for thirty years.

Kieffer Paper Mills Pay Bonus

EWING, Ind., Dec. 28. 1936.—The Kieffer Paper Mills, on November 1, made an adjustment, upward, in the wages of their skilled employees. At the same time they announced that they would pay the usual annual bonus, that has been in effect for the last three years. This bonus was paid on the 24th day of December, and amounted to approximately 5 percent of the annual pay roll.

They also announced that the bonus will be discontinued and that an advance of approximately 5 percent in wages will be effective January 1, 1937.

The Company has, at the present time, on its pay roll, more employees than at any time in the history of the company, which dates back to 1906.

A number of improvements have been made this year among which is a new warehouse, covering between four and five thousand square feet of floor space, with a concrete floor and a new well, with a daily capacity of three-hundred and fifty thousand gallons. They have also added additional cutting, scoring, and slitting equipment, which will further enable the company to take proper care of the increasing number of their customers.

The company has a satisfactory back log of orders, and anticipates being able to continue operating, in at least the first six months of 1937, on the same basis as at the present time.

U. S. Awards Envelope Contract

The new stamped envelope contract has been awarded to the present contractor, International Envelope Corporation of Dayton, Ohio, by the United States. This contract includes all stamped envelope requirements for the calendar years, 1937 to 1940, inclusive, and amounts to nearly nine million dollars for over six and one-half billion envelopes, based on past requirements.

The printed specifications and proposal, issued July 1, called for bids on September 1, and only one bid was received. The amount slightly higher per thousand envelopes than for the contract now expiring, was considered entirely reasonable.

Size 7 has not been popular and has been eliminated from the new schedule; size 6 occurs only in 2c and 3c window envelopes and size 9 will not be supplied in the window type. Precanceling will be done only on the 1c, sizes 5, 8 and 13; airmails will come only on size 8 and 13; all as at present. The papers will be the same weights and colors as at present. The paper contractors, International Paper Company and Aetna Paper Company, do not anticipate any changes in the paper and the same distinguishing watermarks will be present.

Safety

Safety is the title of an attractive brochure recently issued by the National Safety Council, 20 North Wacker Drive, Chicago. It gives an interesting and enlightening picture of accident prevention work from the viewpoint of the presidents of 23 large industrial organizations, all of which are active members of the National Safety Council, and have been for years.

A great deal is heard about the humanitarian side of safety work, but here is the other side of the picture in cold facts and figures—the economic angle.

This booklet is certain to be widely read and it will undoubtedly prove a helpful factor in stimulating interest in the splendid work which the National Safety Council is doing.

Demand an Upswing in Philadelphia

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 28, 1936—Reports from all sources here indicate that business is still on the upswing both in the fine and course paper divisions. The very opposite of what usually prevails in the paper stock market at this season of the year is happening. Softening of prices with an abundance of stock available usually maintain at this time; however, it so happens that prices are stiffening with all available supplies being bought up, and this the merchants here state is indicative of a perceptible rise in prices in the waste paper industry.

Norbert A. Considine, president of the Paper Trade Association of Philadelphia, presided at a special meeting of the Board of Governors held today, at which meeting the following resolution was unanimously adopted:

WHEREAS, it has pleased Almighty God to remove from our midst our esteemed co-worker and favored member, Edward A. Keller,

AND WHEREAS by reason of the loss of his wise counsel and sympathetic interest in the affairs of this association for many years, we desire to bear witness to the sterling qualities and principles of the deceased exemplified in deliberations of this association,

THEREFORE BE IT RESOLVED that we express our sincere sorrow and extend to the members of the bereaved family our heartfelt sympathy.

BE IT FURTHER RESOLVED that the foregoing be spread upon the Minutes of this association and that a copy thereof suitably engrossed and bound be sent to the family.

Miami Valley Expects Prosperous Year

DAYTON, Ohio, December 28, 1936—Maimi Valley paper manufacturers look forward to the greatest year in the history of their trade, according to opinions voiced by leading manufacturers in Dayton, Hamilton, Middletown and other principal mill centers.

The past year far exceeded their expectations, particularly the last quarter, and right now the onrush of orders for virtually all varieties of paper, except newsprint of which none is manufactured in the valley, promises to continue in even greater volume as the year advances.

The holiday season, just passed, proved to be the merriest for both employers and employees for nearly 10 years. Wage increases and bonuses were granted by most of the firms to employees and executives, and in some mills working hours and conditions are being rearranged. It is believed the plan will redound to the credit of both owners and workers, it is stated.

Hoover & Allison Pay Special Dividend

DAYTON, Ohio, December 28, 1936—A special cash dividend of $12 per share to common stockholders, has been declared by the board of directors of the Hooven & Allison Company, Xenia, Ohio, manufacturers of twine, cordage, etc.

The announcement followed on the heels of a Christmas gift of an extra week's pay to all company workers. The company did not announce the total amount dispersed nor the number of beneficiaries.

The firm pays 7 per cent regularly to preferred stockholders, and has not missed a dividend on this stock since the preferred dividend policy was established twenty years ago. It is one of the substantial industries of the Miami Valley allied with the paper trade.

Canadian Technical Section to Meet

The Technical Section of the Canadian Pulp and Paper Association will hold its annual meeting at the Engineering Institute in Montreal, January 27, 28 and 29, 1937, except the Joint Meeting with the Woodlands Section which will be in the Sun Life Building.

Following are some of the papers to be presented:

The Johnston Screen-Classifier, Action on Pulps of Various Types, by W. Boyd Campbell and W. C. Lodge.

The Oil-Paper Relationship in the Printability of Paper, by G. Larocque.

Further Notes on the Extension of Paper by Absorbed Water Vapor, by G. Larocque.

High Yield Sulphite for Newsprint, by H. J. Rowley.

Softness and Opacity in Hardwood Sulphite Pulps, by F. H. Yorston and C. R. Mitchell.

Symposium on Circulation Systems.

A Study of Process Variables using a Miniature Grinder, by J. Edwards and H. W. Johnston.

Development of the Pulpwood Grinder, by Mr. Brown and Mr. Cariss of Waterous Co.

Refining, by A. S. Cosler.

Economic Aspects of Operation of High Speed and Medium Speed, Wide and Medium Width Newsprint Machines, by E. M. Little.

Waste Heat Utilization in Pulp and Paper Mills by R. J. Chambers.

Suction Box Construction and Operation, by James O'Halloran.

Drainage Measurements on Paper Machine Wires at Various Points, by A. A. Scott.

Drainage Characteristics: Laboratory Studies, by W. Boyd Campbell and W. C. Lodge.

A Paper on Theoretical Aspects of Wet End Water Extraction, by Elijah Cowan.

The Woodlands Section meeting jointly with the Technical Section will offer the following papers: Sulphite Pulping of Jack Pine, by Otto Brauns; Grinding Jack Pine, by H. A. Paterson; The Place of White and Yellow Birch among the Commercial Hardwoods of Eastern Canadaby W. J. LeClair.

Miami Valley Shippers Have Good Year

DAYTON, Ohio, December 28, 1936—The Miami Valley Shippers' Association reports, through its secretary, G. R. Braun, of Middletown, Ohio, that the organization "has completed the greatest year in its history, all records of tonnage having been broken." The exact figures will be given out later.

The association has just held its annual meeting in Middletown, its headquarters. The officers elected were: M. H. Stetson, of the Harding-Jones Paper Company of Excello, president; W. W. Winship, Oxford Miami Paper Company, West Carrollton, vice-president; G. R. Braun, re-elected secretary, and William Beckett, of the Beckett Paper Company, Hamilton, treasurer.

The officers, with the following comprise the board of directors: J. J. Hallowell, of the Wrenn Paper Company, Middletown; V. H. Larson, of the Crystal Tissue Company, of Amanda; and C. J. Nicol, of the Sorg Paper Company, Middletown.

There are 24 mills manufacturing paper in the Miami Valley Shippers' Association, the purpose of which is shipping paper of less than car load lots.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Vernon, Cal.—The Fibreboard Products Company, Pacific boulevard, Vernon, near Los Angeles, has taken out a permit for new one-story addition to plant, to be used for storage and distribution. It is estimated to cost close to $21,000, with equipment. General contract has been let to Rainey & MacIsaac, 6624 South Stanford street, and superstructure will be placed under way at once.

Urbana, Ohio—The United Paperboard Company, manufacturer of paperboard products, chip board and kindred specialties, has awarded general contract to the Austin Company, 16112 Euclid avenue, Cleveland, Ohio, for proposed new addition to local mill, recently referred to in these columns.

San Diego, Cal.—The Zellerbach Paper Company, 303 Fifth street, has filed plans for alterations and improvements in one-story storage and distributing building at 1608 Second street, and will proceed with work at once. No estimate of cost announced. Main offices of company are at 534 Battery street, San Francisco, Cal.

Fernandina, Fla.—The Container Corporation of America, Inc., 111 West Washington street, Chicago, Ill., manufacturer of corrugated paper containers, boxes, etc., has awarded general contract to the Merritt & Scott Corporation, 17 Battery place, New York, N. Y., for construction of initial unit of new pulp and paperboard mill at Fernandina, recently referred to in these columns, and work is scheduled to begin early in January. Plant will require close to one year for completion. It will comprise a large group of one and multi-unit buildings, designed for an ultimate capacity of 350 tons per day. Cost estimated close to $6,000,000. George F. Hardy, 305 Broadway, New York, is consulting engineer. Walter Paepcke is president of company.

Indianapolis, Ind.—The Imperial Wax Products, Inc., 717 Fulton street, recently organized with capital of 1,200 shares of stock, no par value, plans operation of a local plant for the manufacture of waxed and other processed paper stocks. New company is headed by Leroy Weis, Edwin J. Kuh, Jr., and Stanley A. Kaplan. It is represented by Jacob S. White, Merchants Bank Building. It is proposed to begin production at early date.

Los Angeles, Cal.—The Pioneer-Flintkote Company, 5500 South Alameda street, Vernon, Los Angeles, manufacturer of roofing and building papers and allied products, has awarded general contract to the William P. Neil Company, Ltd., 4814 Loma Vista avenue, Vernon, for small one-story addition to plant, for which superstructure will be placed under way at once. No estimate of cost has been announced. Company has plans maturing for large one-story unit at plant, recently referred to in these columns, to be equipped as a corrugated box and container manufacturing plant, and will take bids on general contract at early date. Preliminary plans also are in progress for other one-story plant units for other departments, including storage and distribution. Entire expansion project will cost close to $1,000,000. Edward C. and Ellis W. Taylor, 803 West Third street, Los Angeles, are architects. Company is a subsidiary of the Flintkote Company, 50 West 50th street, New York, N. Y.

Fall River, Mass.—The Alden Corrugated Container Corporation, recently organized with capital of $90,000, plans operation of a local plant for manufacture of corrugated boxes and containers. Michael Zuckerman is president, and Harry Gottlieb, 237 Milton street, Fall River, treasurer and representative.

Cincinnati, Ohio—The Clopay Corporation, York street, manufacturer of paper products, has construction well advanced on new addition to paper converting plant, previously referred to in these columns, and will have unit ready for service at an early date, when large increased capacity will be developed. New structure will be two-story, 100 x 220 feet, estimated to cost in excess of $100,000, including equipment. General erection contract is being carried out by the Parkway Construction Company, Keith Building, Cincinnati. Carl J. Kiefer, Inc., Schmidt Building, is consulting engineer.

Cardiff, Wales—Towner & Co., Ltd., Cardiff, manufacturer of paper products, has plans maturing for a new pulp and paper mill Ely, Wales, where large tract of land has been selected. It will consist of several one and multi-story units, with power house and other mechanical departments, reported to cost over $1,000,000. Work is scheduled to begin early in 1937. Jervis, Hitchins & Company, Ltd., 3 Central Chambers, S.W., London, are engineers.

New Companies

New York, N. Y.—The Whitney Manufacturing Corporation has been chartered with capital of $100,000, to manufacture paper products of various kinds. New company is represented by Louis J. Altkrug, 521 Fifth avenue, New York, attorney.

New York, N. Y.—The Automatic Post Card Folder Corporation has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in paper specialties and card stock equipment. New company is represented by Maxwell M. Rudaw, 512 Fifth avenue, New York, attorney.

Manufacture of Paper in India

In an article in the issue of the PAPER TRADE JOURNAL of October 29, 1936 entitled "Manufacture of Paper in India," by G. G. Gulrajaney, it was stated that India imported annually paper worth more than Rs. 260,000,000. These figures were incorrect. They should have been Rs. 2,60,00,000.

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COMING EVENTS IN THE PAPER INDUSTRY

American Paper and Pulp Association, Sixtieth Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 22-26.

Technical Association of the Pulp and Paper Industry, Convention, Waldorf-Astoria Hotel, New York, February 22-25. Annual Luncheon, Waldorf-Astoria Hotel, Thursday, February 25.

Salesmen's Association of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 23.

New York Association of Dealers in Paper Mill Supplies, Annual Banquet, Hotel Commodore, New York, February 24.

National Paper Trade Association of the United States, Convention, Waldorf-Astoria Hotel, New York, February 22-26.

Canadian Pulp and Paper Association and Sections, Annual Meeting, Montreal, January 27-29.

New England Section, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

Delaware Valley Section, Technical Association of the Pulp and Paper Industry—Fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

THE PERFORMANCE OF UNIONISM IN HEAVY INDUSTRY

Collective bargaining in important heavy industries failed to increase either employment opportunity or labor purchasing power during the prosperous period ending in 1929, point out the two prominent business economists, Allen W. Rucker and N. W. Pickering, in their latest study of employment and wage conditions in industry. "In the rising period of prosperity ending in 1929, none of the six union industries studied increased purchasing power more than 2.5 per cent over 1923, as compared with 11.8 per cent average increase in all manufacturing. In that same period, these six union industries accounted for a total loss of employment opportunity which reached the impressive figure of 637,696 fewer jobs than in 1923."

The study includes Anthracite and Bituminous Coal Mining, Glass Manufacturing, Railway Repair Shops, Railway Transportation and Shipbuilding. The data, covering both the prosperity era 1923-1929 and the depression era 1929-1933, have been released in booklet form by Farrel-Birmingham Company, Inc., Ansonia, Conn. and Buffalo, N. Y.

The unfavorable performance of unionized heavy industry in the matter of purchasing power creation is reflected in the results for the period of depression, 1929-1933.

Without exception, the authors state, the total purchasing power of payrolls declined in all six industries. That a decline was to be expected is of course granted; the degree of the decline is the noteworthy point. That especially is true in Anthracite Coal Mining where the index of purchasing power fell to 49.8 per cent of the 1923 level; Bituminous Coal, which went to 33.9 per cent of 1923; Railway Repair Shops, which shrank to 51.0 per cent of the 1923 level, and Shipbuilding, which dropped to 52.5 per cent of 1923. The somewhat better showing by Railway Transportation (65.7 per cent of 1923) and Glass Manufacturing (70.7 per cent) does not counterbalance the weight of evidence supplied by the trend in the other four industries.

The substantial declines in these six heavy industries in 1933 definitely deny any claim that the theory of wage and hour regulation has the general effect of maintaining the buying power of labor in a period of depression.

Judging the European theory solely on the merits of its own showing as revealed by the end results in six heavy industries here reviewed, the weight of evidence against its correctness is almost overwhelming. What actually happened the authors say decisively denies the theory.

The logical conclusions from the data presented it is asserted are obvious; the weight of the evidence definitely disproves the European theory that wage and hour regulation by union organizations produces any real benefits for labor as a whole.

In the six industries reviewed, the end results show that the increase and stabilization of the average annual income of some employed workers were secured at the expense of a serious decline in both total employment opportunity and total purchasing power. There was no real increase but merely a shifting and concentration of income into fewer hands. That, of course, is the result expected of any type of monopoly.

That phenomenon was not confined to the depression period but was markedly in evidence during the prosperity period ending in the 1929 peak. In that period, the purchasing power of labor had no appreciable increase, and it actually diminished in some instances reviewed herein. Likewise, the total employment opportunity declined in all industries here reviewed during the prosperous era. The shrinkage totalled 637,696 fewer jobs in six industries alone, or 19.0 per cent reduction in job security in the most prosperous period in recent history.

The performance of unionism in these heavy industries, when viewed in the combined light of annual incomes per employed worker, total employment opportunity and total purchasing power generated, compels the conclusion that the practical end results do not at all confirm the claims made. There is, instead, ample ground for labor as a

whole to thoroughly distrust unionism and the entire theory of wage and hour regulation borrowed from feudal European philosophy.

The factual compilation in the study records the end results of long term, large-scale experiment with the European theory of wage and hour regulation; those results re-emphasize the necessity for a consideration by employees and employers alike of vital questions:

1. Does the practical performance of unionism any longer warrant the unquestioning confidence and financial support of American wage-earners?

2. Is not public endorsement of trades-union tactics traceable to a misconception and to misinformation regarding its actual effect upon both labor and the national economy?

3. Is not the threatened extension of Federal control over the wage and hour policies of industry calculated to retard and impede the national progress and to launch the United States upon the same reactionary course which has virtually wrecked constitutional, liberal government in western Europe?

4. And, finally, is it not now the opportune time for management to take the aggressive in promoting among employees, government officials and the public a true understanding of the facts?

These vital issues the authors assert cannot longer be neglected if the national welfare as well as the individual welfare of labor, is to be promoted soundly.

Dr. Herty to Head Georgia Conservation Dept.

With the establishment of a new State Department of Conservation in Georgia, to be authorized at the forthcoming session of the State Legislature in January, Dr. Charles H. Herty will be appointed to head the new division, which will give particular attention to the development of the paper-making industry in the State. Dr. Herty has been active in recent years in perfecting the commercial production of paper from Georgia slash pine pulp, and in addition to this phase of development, the new department will devote efforts to the other natural resources of the State and the promotion of such advantages to industry. The Department of Conservation will consolidate the present Divisions of Forestry, Geology, and Game and Fish.

Government Paper Awards

WASHINGTON, D. C., December 30, 1936.—The Whitaker Paper Company has been awarded the contract for furnishing the Government Printing Office with 10,500 pounds (33,000 sheets) of 24 x 36 high finish red sulphite paper at 6.5 cents per pound. The same company will also furnish 10,000 pounds (25,000 sheets) of 22½ x 28½ manila cardboard at 3.88 cents per pound. Doubler & Mudge will furnish 100,000 pounds of machine finish book paper in 21 inch rolls at 5.07 cents per pound. Bids for all of these items were received on December 11.

The Old Dominion Paper Company will furnish 35,000 pounds (200,000 sheets) of 29 x 41 single coated book paper at 6.6 cents, bids for which were received on December 4.

Production Ratio Report

The statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1936	1935	1934
January	76.1%	65.8%	.....
February	77.9%	70.0%	.....
March	76.0%	70.5%	.....
April	82.3%	70.0%	.....
May	81.6%	69.4%	.....
June	80.7%	72.3%	.....
July	77.3%	64.9%	.....
August	81.5%	70.9%	.....
September	80.5%	71.9%	58.2%
October	87.6%	75.6%	64.7%
November	88.0%	75.3%	61.7%
December	.....	71.2%	59.6%
Year	.....	70.5%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1936		CORRESPONDING WEEKS, 1935	
*December 5	90.3%	December 7	76.0%
*December 12	92.8%	December 14	76.2%
*December 19	93.2%	December 21	79.0%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: Dec. 5, 1936	Dec. 12, 1936	Dec. 19, 1936
0% to 50%	52	49	32
51% to 100%	274	272	185
Total Mills Reporting	326	321	217

* Subject to revision until all reports are received.

Paperboard Operating Ratio

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Months	1936	1935	1934	Months	1936	1935	1934
January	61%	61%	....	July	69%	59%	....
February	67%	67%	....	August	75%	65%	....
March	68%	67%	....	September	76%	69%	62%
April	70%	61%	....	October	82%	76%	63%
May	68%	61%	....	November	....	70%	56%
June	68%	65%	....	December	....	60%	52%

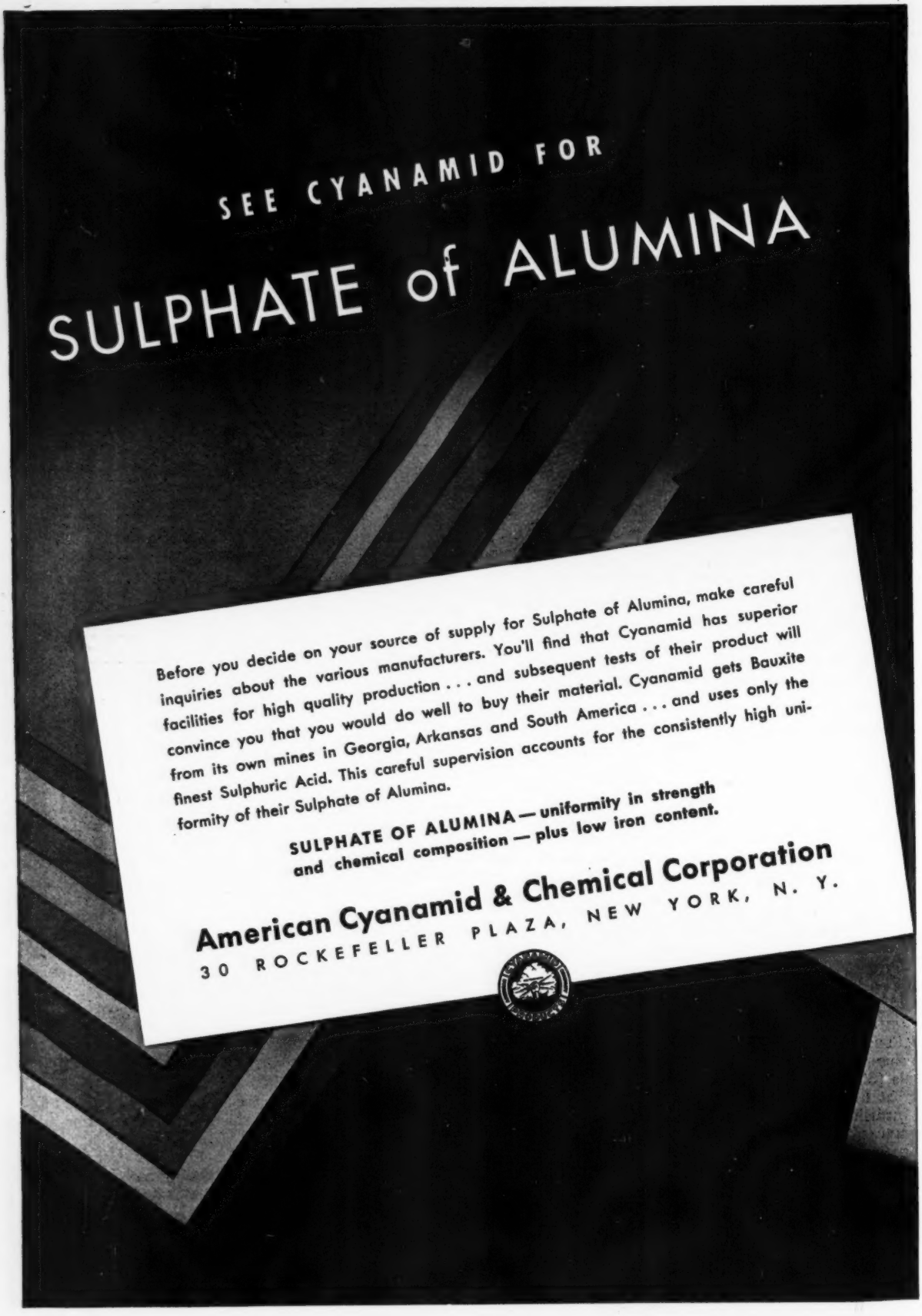
Week ending Nov. 7, 1936—79%
Week ending Nov. 14, 1936—81%
Week ending Nov. 21, 1936—80%
Week ending Nov. 28, 1936—75%
Week ending Dec. 5, 1936—78%
Week ending Dec. 12, 1936—81%
Week ending Dec. 19, 1936—82%

L. E. Smith Leaves Nekoosa Edwards

J. E. Alexander, president and general manager of the Nekoosa Edwards Paper Company of Port Edwards, Wis., recently announced the resignation of L. E. Smith, manager of manufacturing of that firm, to take effect January 1, 1937. He further stated that Mr. Smith would take an extended trip through the South on a special assignment for the Company, after which he would take a well earned vacation. Mr. Smith did not make known his plans for the future. Mr. Smith has been in the employ of the Nekoosa Edwards Company in excess of twenty-five years. He started at the bottom and rose to time keeper, chain-gang boss, shipping room foreman, finishing room foreman, then to order department in Main Office, night foreman sulphite mill, Port Edwards, sulphite superintendent, Nekoosa, general superintendent of all chemical pulp mills, assistant to the general manager and manager of manufacturing.

Mr. Smith was very active in business and civic affairs, serving on the Board of Education for six terms and as the first Mayor of Nekoosa after it became a city. He is a director of the Nekoosa Edwards Company, vice president and director of the Building and Loan Association and a director of the Nekoosa State Bank.

In company with W. G. Mac Naughton he attended one of the first organization meetings of TAPPI of which he was an early member. He was chairman of the Northwestern Division of the Superintendent's Association.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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Instrumentation Studies III

The Evaluation of Formation by the Thwing Formation Tester

By The Staff of The Institute of Paper Chemistry

The purpose of this article is to describe briefly the basic principles of the formation tester and to present the results of an experimental study of the application of this instrument to the grading of various types of papers.

The term "formation" is usually considered as the comparative uniformity of sheet structure and is often visualized as a combination of two components:

1. Compactness, which is a measure of the fine irregularities or "openness" of the sheet structure.
2. Uniformity, which is a measure of the regularity with which the irregularities in sheet structure occur.

Formation has in the past been judged visually by comparison, as viewed by transmitted light, with sheets set up as standards. These standards display a fair range in uniformity and compactness. In this comparison, the ratio of the variation in transparency to the average transparency plays an important role. This ratio is the quality evaluated visually, and the factor measured by the formation tester.

The Thwing formation tester was originated in the laboratories of the Kimberly-Clark Corporation, where an experimental model was built[1] and is in use for the evaluation of formation. The practicability of the tester from a commercial production standpoint has been demonstrated in the manufacture of the commercial model which is now at The Institute of Paper Chemistry. This latter instrument has proven satisfactory from an electrical and mechanical standpoint and, furthermore, the results obtained on it check favorably with the results obtained on the experimental model at the Kimberly-Clark laboratory.

The instrument consists of two units. The first unit contains a pair of 8 inch plate glass discs mounted horizontally on a vertical shaft and driven by a 110 volt a. c. motor. The sample is mounted between these discs. Above the discs is a light source, with an adjustable diaphragm and a lens system, allowing a small beam of light of controlled intensity to be projected on the rotating sample. Below the discs is a photoelectric cell, mounted as an integral unit with the light source, the entire unit being attached to the frame by a flexible mounting. As the sample disc rotates, this light and cell unit is oscillated back and forth across a path about one inch in width. This scheme allows the scanning of a large portion of the eight inch circular sample and, through a suitable electrical system, integrates the formation automatically, giving an average value for the path scanned.

The light which passes through the paper from the source to the cell produces a current proportional to the intensity of the transmitted light, and hence to the momentary transparency of the paper. One can readily visualize the cell voltage curve resulting from the light transmitted through a sheet of paper. The voltage curve will, in fact, be an exact reflection of the formation of the particular sample, the average value being dependent upon the average transparency, and the fluctuation dependent upon the non-uniformity in transparency. Now, if we can measure this fluctuating or a. c. voltage and compare it correctly with the average voltage, it is readily seen that we are actually measuring the desired ratio or formation. This, as will be explained, is exactly what is accomplished in this formation tester.

The voltage set up in the photocell is carried to the second unit housed in a separate cabinet, and impressed upon the grid of the first amplifier tube in a three tube shielded dry battery operated amplifier. A push button switch on the amplifier panel allows alternate connecting and disconnecting of the photocell and "C" battery to the grid of the first tube. The purpose of this switch is to compare the average d. c. value of the photocell voltage with a known voltage. By means of the diaphragm the amount of light passing through the paper is varied until a balance of these voltages is obtained. This balance is indicated by a plate current milliammeter located on the left side of the amplifier panel. From the simple theory of the vacuum tube, the plate current is dependent upon the grid bias voltage showing changes in grid bias amplified many times. Therefore, in varying the amount of light falling on the cell, a point is reached where the average cell voltage equals the "C" battery voltage. At this point a shorting of battery and cell by means of the switch will cause no change in plate current. This balance indicates the proper light transmission, irrespective of the average transparency of the paper. This corrects for different basis weights and other factors affecting average transparency and thus provides a basis for comparison preparatory to measuring the alternating current from the photocell, which serves as the measure of formation. In other words, referring to our definition of formation or transparency ratio, we have in effect brought all samples to the

same average transparency and can therefore take the change in transparency, as indicated by the a. c. component, as a measure of formation.

The a. c. component of the photocell voltage is amplified to a value that can be easily measured on the a. c. voltmeter located on the right side of the panel. In order to throw the formation readings in line with the values of visual grading, the reciprocal of the a. c. voltage x 100 is taken. If, for example, the a. c. voltage is 1.0, the formation is 100. If the voltage is 2.0, the formation is 50. A formation graded visually at 65 will read approximately 60, while a visual formation of 80 will read approximately 130. These values are, however, only relative. The instrument gives comparative readings using a standard sample. Assuming a standard which is arbitrarily given a formation value of 100, the sample is placed in the instrument and a balance obtained. By means of a volume control on the center of the amplifier panel, the a. c. meter is set at 1.0, and the instrument is then adjusted to give a formation reading on any sample relative to the standard used.

In addition to the meters and controls mentioned, the amplifier panel carries a meter for measuring the filament and plate volts on the tubes and a rheostat for adjusting filament volts. A single-pole, double throw switch at the left side of the panel changes the grid bias on the first tube, allowing use of 1.5 or 3 volts. A balance is obtained on a low opacity sheet by using the three volt grid bias as a comparison. On a high opacity sheet 1.5 volts are used to obtain a balance, in which case the a.c. meter reading is multiplied by 2. This 1.5 volt grid bias also serves to extend the range of the instrument. If a sample is balanced on the 3 volt grid bias and shows a low formation reading (i. e., over 2 a. c. volts or less than 50 formation), the 2 volt a. c. meter will be off scale. If the grid bias is then changed to 1.5 volts, and a new balance obtained, the meter reading multiplied by 2 will give the correct formation.

The amplifier circuit is so calculated and designed that only variations in unformity of about 2 inches or less (causing frequencies of 400 cycles or more) show up in the a. c. circuit. The action of the circuit on variations with larger areas, or lower frequencies, is to average the formation of these areas. This characteristic will give a minimum effect of an accidental spot or damage to the paper and reduce to a minimum the effects of low frequency disturbances, both internal and external.

The readings obtained are practically independent of the photocell output characteristics and color sensitivity, since readings are taken with balanced conditions; therefore a change in photocell will not change the formation reading. This is also true for the light source. In other words, a balance having been obtained, the average d. c. voltage output is fixed at a definite value, irrespective of relative cell output and lamp intensity.

Experimental Work

Samples of uncoated book papers submitted by the Book Grading Committee for grading tests have been used for investigating the reliability and accuracy of the new formation instrument. Sample discs from these papers were measured with the experimental model at the Kimberly-Clark laboratories, check readings being taken. The same discs were then measured on the Thwing instrument at The Institute of Paper Chemistry. The results, which are given in Table 1, show that check measurements on the same disc taken on the Kimberly-Clark instrument agree extremely well, proving that the experimental instrument is entirely consistent in its measurement. When

TABLE I.—COMPARISON OF READINGS ON EXPERIMENTAL MODEL AND COMMERCIAL MODEL OF THE THWING FORMATION TESTER

Sample Number	Experimental Model			Commercial Model
	A	B	Average	
1	60	61	61	59
2	54	56	55	55
3	67	68	68	71
4	56	57	57	58
5	60	61	61	59
6	79	81	80	74
7	52	54	53	52
8	52	53	53	55
9	79	81	80	80
10	66	68	67	70
11	73	72	73	71
12	79	80	80	81
13	55	56	56	53
14	58	59	59	55
15	91	92	92	92
16	85	88	87	88
17	84	83	84	88
18	53	54	54	58
19	79	80	80	85
20	75	76	76	79
21	85	86	86	85
22	107	109	108	111
23	94	93	94	93
24	92	93	93	95
25	98	98	98	98
26	95	97	96	91
27	91	92	92	92
28	115	115	115	114
29	102	102	102	105
30	117	114	116	123
31	118	118	118	115
32	127	128	128	135
33	149	147	148	147
34	143	141	142	159

the readings taken with the Kimberly-Clark experimental model are compared to those taken with the Thwing instrument on the same disc, it is seen that the two instruments check each other very closely, with the exception of those papers in the high range of formation (visual grading of 80). This is probably due to the use of a larger diameter light beam in the Thwing instrument; this difference probably makes the Thwing instrument less sensitive to non-uniformities of minute size. With another instrument in which the diameter of light beam used in the Thwing was exactly duplicated, these discrepancies would not appear, though they are not of great importance, since they are all within a range which, for practical purpose, would be considered the best formation.

To check further the duplicability of results, another set of discs from these same samples was measured at the Institute by two different observers at different times. The readings are given in columns A and B of Table II. This Table also gives the readings with the same instruments on the set of discs of the same samples used in Table I. Visual gradings based on Mead Standards made prior to and independently of the instrumental readings are also given. From these results the previous conclusion as to duplicability and reproducibility of results is entirely substantiated for the Thwing instrument. When the measurements on two separate discs of the same samples are compared, it is seen that, in the majority of cases, they agree very closely, though in some cases there is an appreciable disagreement, apparently due to variations from one part of the sample sheet to another. It was not expected that an eight inch disc would show a representative formation for a whole sample, and for accurate work more than one disc (though the number should not be over 3 or 4) will have to be measured for each sample.

The correlation between visual gradings previously made and instrumental measurement is only fair, but when one considers the weaknesses of visual grading, it is as good as could be expected. From the data presented, the reliability of the instrumental measurements appears to be well established. The remaining question and one of major importance is: Does the instrument measure the same

TABLE II.—COMPARISON OF FORMATION READINGS OF SEPARATE DISCS OF SAME SAMPLE AND TO VISUAL RATING USING THE THWING INSTRUMENT

Sample Number	Observer A	Observer B	Observer Average	Different Discs of Same Sample	Visual Rating
1	60	59	60	59	65
2	51	52	52	55	65
3	69	69	69	71	65
4	59	59	59	58	65
5	66	64	65	59	65
6	71	72	72	74	67.5
7	51	50	51	52	67.5
8	58	58	58	55	67.5
9	74	74	74	80	67.5
10	71	71.5	71	70	67.5
11	73	74	74	71	70
12	66	66	66	81	70
13	54	55	55	53	70
14	57	57	57	55	70
15	82	80	81	92	70
16	85	85	85	88	72.5
17	97	95	96	88	72.5
18	66	66	66	58	72.5
19	80	80	80	85	72.5
20	78	77	78	79	72.5
21	82	83	82	85	75
22	116	112	114	111	75
23	98	98	98	93	75+
24	93	93	93	95	75
25	98	99	99	98	77.5
26	105	103	104	91	77.5
27	91	90	91	92	77.5
28	117	117	117	114	77.5+
29	115	115	115	105	80—
30	125	126	126	123	80
31	110	107	109	115	80
32	116	115	116	135	80
33	112	111	112	147	80
34	152	154	153	159	80

property which is visually evaluated as formation? When several persons independently rate a group of papers in the order of their formation, one cannot help but realize the part that personal preference and attendant circumstances play in these ratings. The writer feels that the lack of correlation is largely due to inaccuracies of visual grading, and the best way to answer this question is to arrange a group of papers in the order of their instrumental readings, and then by visual inspection determine if any are seriously out of order. From the observations of several competent persons, who have examined groups of papers arranged in this way, it would appear that the instrument rates the formation of papers in the order of visual grading.

A further group of uncoated books, which had been graded visually, were read on the Thwing tester. Both these and the papers from which the data in Tables I and II were taken are from the papers submitted by the Book Paper Division during 1934. These readings are given in Table III. The same conclusion as to the correlation between visual and instrumental grading that was drawn from Table II applies here.

Thwing readings have been taken on three samples each of the formation standards sent out by the Book Grading Committee as the limiting formations for the three grades of book paper. The average readings are as follows:

TABLE III—UNCOATED BOOKS

Visual Rating	Thwing Reading
67.5	50
70	51
70	52
70	54
70	72
72.5	118
75	74
75	85
75	115
75	143
77.5	71
77.5	91
77.5	100
80	109
80	133
80	139
80	151

Visual Formation	Thwing Reading
80	141
75	120
65	67

These readings show the comparatively wide spread of the range of Thwing readings for the present standards.

A set of Mead formation standards was measured on the Thwing instrument and the readings are compared with the visual ratings in Table IV.

TABLE IV—MEAD FORMATION STANDARDS

Visual Grade	Thwing Reading
55	56
60	62
65—	54
65	58
70—	62
70	88
75—	88.5
75	110
80—	125
80	179

Twelve samples of lithograph papers have been measured on the Thwing instrument and, though these were not graded visually, they show a fairly wide range in formation readings, and it seems probable that the instrument may be applied to this grade.

Several coated book papers and several bond papers have also been read on the instrument; it is felt that the instrument is not as well suited to these papers as it is to uncoated books, since the readings obtained fall in a rather narrow range. It must be remembered that all grading for formation must be confined to the particular type of paper under consideration at the time, for while the formation readings for bond might fall in part of the same range of instrument readings as those for uncoated books, the degree of uniformity that is considered good for one type may not be for another.

Literature Cited

[1] Davis, Myrl N., Roehr, Walter W., and Malmstrom, Homer E. An instrument for formation measurement. *Tech. Assoc. Papers* 18:386-391; discussion, 68-69 (June, 1935); *Paper Trade J.* 101, no. 4:31-36 (July 25, 1935).

Venezuela Market for Paper Specialties

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1936.—The market in Venezuela for paper specialties such as cups, plates and straws will undoubtedly be stimulated as a result of the recent action of the Venezuelan Congress in reducing the import tariff on certain paper specialties, according to a report to the Department of Commerce from its Caracas, Venezuela office.

During the calendar year 1935, the latest period for which statistics are available, imports of paper cups into Venezuela were valued at Bolivares 35,959 (approximately $8,990) of which Bolivares 35,800 (approximately $8,950) originated in the United States, the report states.

It is not possible to estimate the amount of paper plates or other specialties of this class that were imported into Venezuela because of their inclusion in the nonspecified classifications, it was stated.

The largest users of paper cups and spoons in Venezuela are the manufacturers of ice cream which is sold by itinerant vendors in small cups to which caps are attached, the report states.

Price rather than quality is the most important factor in the paper specialty market of Venezuela. Manufacturers of paper cups, particularly of the size used by the ice cream manufacturers, who desire to introduce their products into the market should appoint an exclusive agent who is in a position to keep the product constantly before local buyers, according to the report.

The Microscopical Mechanism of Rosin Sizing*

A Preliminary Report of Observations of Rosin Size in Paper

By H. N. Lee[1]

Abstract

Microscopical studies have been made of a number of variously-prepared, rosin-sized papers.

By semi-diagrammatic drawings and descriptions the appearance and distribution of precipitated rosin size in these papers are described.

Characteristics of rosin sizing as determined in these papers are listed.

Tentative deductions are drawn concerning some of the highly disputed questions relating to rosin sizing in paper:

(a) In all papers rosin is irregularly distributed: most irregularly in the most poorly sized, most regularly in the most effectively sized.

(b) Rosin is typically present as discrete particles, ranging in dimensions from the smallest that can be distinguished—and probably smaller than can be differentiated—to masses or aggregates many microns or even millimeters in diameter.

(c) In the more nearly completely sized papers the particles are typically not fused; in the more poorly sized they may be.

(d) More rosin does not necessarily result in better sizing. Less than one per cent of very fine and uniformly distributed particles gives much better results than two per cent or more of large, irregularly scattered or fused particles or masses.

(e) Poor sizing may result from use of too little rosin for full protection of the fiber surfaces or from the aggregation or fusion of particles where more rosin is present. In either case areas of the fiber surfaces are left unprotected.

(f) No continuous film either coating the individual fibers or filling the interstices can be demonstrated.

(g) The best sizing in the papers described is apparently correlated with the finest particles, which in turn result in the most uniform distribution.

Since its inception about 130 years ago, the mechanism by which rosin size, precipitated by alum, causes paper to be water resistant has probably been the subject of more investigations, discussions and controversies than any other process relating to paper making. It is the purpose of this article to describe the appearance and distribution of rosin size in several commercial and experimental papers, each made with one per cent or more of rosin. In some of these the resulting sizing is satisfactory, in others not so. General conclusions, as far as such are indicated, must be considered as tentative and subject to modifications as further investigations reveal more details of the limits and variations of various sizes when applied to papers prepared under different conditions.

Advantage is taken of the excellent review of sizing literature by Sutermeister (*9*) on the problem of rosin distribution and action in paper.

The following is quoted from Sutermeister's introduction (p. 460): "It was hoped that a study of the literature would so correlate the various bits of information that many of the apparent contradictions would disappear, but this has proved true only in a minor degree. . . . The general impression gained during the course of this work is that many statements are made as facts which it is suspected are really personal opinions. . . . In spite of the great amount of work which has been done on sizing there is still much uncertainty about the chemistry and physics of the process. This has been emphasized by many writers and still more by the unexpected results often obtained, even where the sizing operation is supposed to be well standardized. . . . The complexity of the problem and the difficulty of sizing investigations have been emphasized by numerous writers."

Review of Literature

The most striking feature found in the literature is the remarkable lack of unanimity in regard to almost any and every factor that can be considered. Reference is made to Sutermeister (*9*) for a review of the numerous contentions. It is perhaps sufficient to state here that the great differences in methods of preparation and of application may have much to do with the variations in results found by investigators. Furthermore, many of the published statements appear to be based on speculation rather than on actual observations.

The chief theories of the mechanism of rosin sizing appear to be concerned with (1) the mechanical deposition of free rosin, (2) the chemical precipitation of aluminum resinate, (3) the adsorption of colloidal particles, or (4) any combination of these. In any case, aluminum sulphate appears to be accepted as unique and necessary in the production of satisfactory sizing. The colloidal theory apparently requires a complete coverage of the fibers, which is claimed by some writers; the other two theories are variously said to require complete coverage or to have the rosin held by what, to all intents, is mere filtration. Aluminum sulphate is diversely stated to act in all ways: as an acid precipitant, as a flocculating mass, by changing the charges on the fibers, or by chemical combination. In short, it appears possible, to find in the literature some authority for any possible form of rosin in paper that the human mind can conceive. Some authors are not content to contradict others, they even contradict themselves. It is hoped that the microscopical observations herein reported will serve as a substantial basis on which to build positive facts to assist in elucidating accurately and intelligibly the physical mechanism of rosin sizing and as a foundation for both scientific understanding and correct technical balance in the application of sizing.

As this was being written Robinson (*6*) published a thesis which, while it does not refer directly to microscopical work, appears to merit particular attention here. Parts of his findings which relate to this study are summarized briefly.

In hand-made sheets he found no difference in results when using sodium abietate or commercial rosin size (30 per cent free rosin). In the presence of fibers sodium abietate is partly hydrolyzed and free rosin as well as aluminum abietate are precipitated on the fibers. (This was apparently determined by solubilities and chemical calculations from ash, not by direct observation.) Air-

* Republication rights are retained exclusively by the author.

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dried sheets gave as high or higher sizing tests than those dried at 105 deg. C. for ten minutes. Rosin in air-dried sheets could be entirely extracted with chloroform but not completely in the case of heated sheets. Although he states that it must be assumed that the quantiy of rosin, including the proportions of free rosin and of aluminum resinate, must be related to the sizing of paper, he was unable to establish correlations between sizing tests and the other variables studied; *e.g.*, kinds of pulps, kind of size, amounts to free rosin and aluminum abietate, etc. Poorly sized sheets may retain just as much rosin as well-sized paper made in the same manner and from this he concludes that particle size or distribution is an important factor in obtaining a well-sized sheet.

Reports of Previous Microscopical Investigations

The only well-described microscopical observation of precipitated rosin size in paper is that by Arnot (*2*) which Sutermeister (p. 462) summarizes as: "Arnot claims that sized fibers in the dry state under the microscope appear to be coated with minute globules or granules. When mounted in glycerol unsized fibers swell rapidly and sized fibers slowly, while the granular coating does not swell."

J. Strachan (*8*) explains certain conditions in rosin sizing in paper and refers directly to microscopical examination in connection with one of these, *i.e.*, the effect produced with sulphuric acid instead of alum. He does not, however, illustrate the diffusion of rosin into the interior of the fiber which he claims occurs.

Graff (*4*) says: "The relative distribution of all precipitated forms of size on the fibers can be determined . . ." but apparently has not published any findings.

Weiger (*10*) shows photomicrographs of rosin size before and after precipitation. It is not stated that this illustrates the condition in finished paper and presumably it does not. The illustrations are not at all fully described.

Georgi (*3*) shows photomicrographs of rosin size "paste" as seen by ordinary and by polarized light. The liquid crystal form in which the rosin size exists is also shown after being gently squeezed. Spherical droplets of free rosin, which form by diluting the paste with water, are shown at 1500 diameters as seen in the ultra microscope.

Paper Examined

The papers examined in this investigation include two all rag, one alpha pulp, three bleached sulphite, and one unbleached kraft. They were made on paper machines, experimental or commercial. They were variously furnished with from about one per cent rosin to upwards of five per cent. Except the permanent book paper, they were all intended to be hard sized and there is every indication that all contained sufficient rosin to produce hard sizing. However, the sizing as indicated by pen and writing ink varies from almost slack to very resistant.

FIG. 2.
Surface of a permanent book paper. Approximately 620 diameters.

The microscopical examinations made are represented in semi-diagrammatic form. Photomicrographs taken in color are on exhibition in the museum of Arthur D. Little, Inc., Cambridge, Mass., where they may be seen at any time. It is difficult to reproduce exactly in drawings the actual appearance as seen in the microscope, and the drawings, especially in those cases where variations occur, may include fibers chosen from several different microscopical fields of view.

Fig. 1 shows precipitated rosin size as seen on the top surface of a 100 per cent rag, permanent book paper, magnified about 370 diameters. This is a high-quality paper, specified as having less than one per cent rosin and with a pH of over 5. It is poorly, almost slackly, sized to writing ink on both surfaces. The figure shows parts of three fibers with the precipitated rosin appearing in what may, for convenience, be called three forms. One of these forms is irregularly shaped and distributed in entirely separate particles which are usually very fine; another form consists of what may be groups of the finer granules or nearly solid masses; the last consists of masses frequently very large and homogeneous and commonly filling the depression of one side of the cotton fibers. The fiber shown in the middle has started to split longitudinally and the fibrillæ filling the spaces between the fibers have enmeshed in them many particles of size. Much, perhaps most, of the rosin is in the non-granular form. The fine, granular particles tend to be largely in the fibril-

FIG. 1*
Surface of an all rag book paper. Approximately 370 diameters.

* In this and the following figures a scale is included to give a visual comparison for the degree of magnification. The line in each case represents 100 mu, which is 0.1 millimeter or about 1/250 inch.

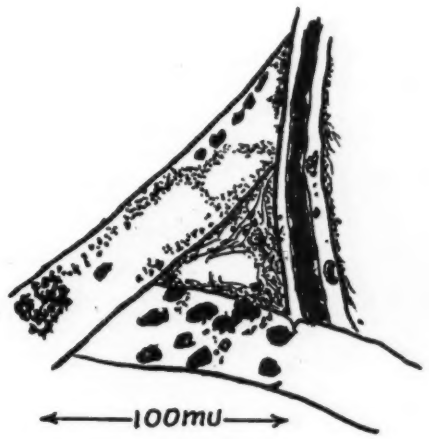

FIG. 3.
Surface of an all rag paper. Approximately 370 diameters.

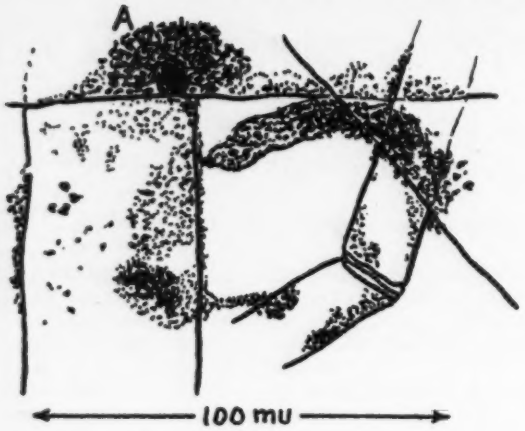

FIG. 4.
Top surface of a sulphite bond paper. Approximately 620 diameters.

lated cellulose which fills the spaces between the fibers. The ordinary surfaces of the fibers carry the least amount of the rosin.

Fig. 2 shows a small area of the same paper illustrated in Fig. 1 but magnified about 620 diameters. This depicts particularly the finer, irregular particles, sometimes grouped and some in almost homogeneous globules. It is not difficult to conceive liquid crystals described by Georgi (*3*) as looking like this when precipitated and dried.

Fig. 3 shows precipitated rosin size as seen on the top surface of a 100 per cent rag paper, magnified about 370 diameters. This was made on an experimental paper machine, of "old" rags, sized with two per cent rosin. The paper is poorly sized, feathers, but is not completely slack-sized to writing ink. The condition of the precipitated rosin size is much the same in Fig. 3 as described for Fig. 1. Poor sizing in both is apparently due to the massing of much of the rosin in homogeneous groups which seem to have little sizing value. Many areas are entirely free of rosin in any form. In both these papers the appearance and distribution of the rosin size is much the same on both sides of the sheets. The reaction to writing ink is also practically the same on the top and the wire sides of the respective papers.

Fig. 4 shows precipitated rosin size as seen on the top surface of a low quality 100 per cent bleached sulphite

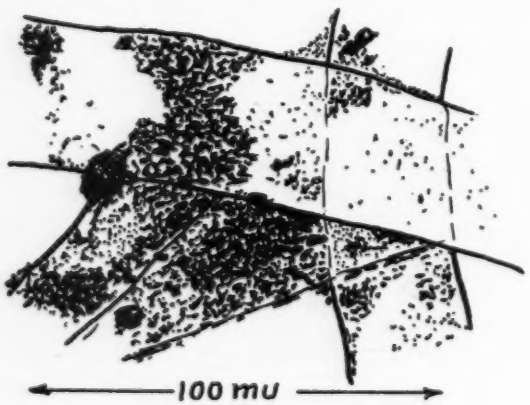

FIG. 5.
Top surface of a watermarked sulphite bond paper. Approximately 620 diameters.

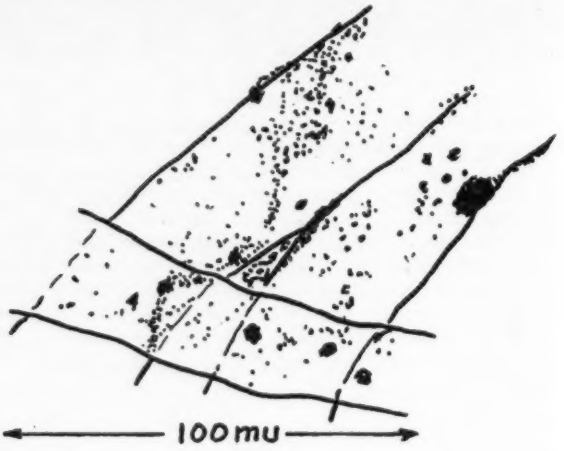

FIG. 6.
Wire surface of a watermarked sulphite bond paper. Approximately 620 diameters.

bond, sized with four or five per cent of rosin size, magnified about 620 diameters. This paper was made on a fast-running commercial paper machine at a time when trouble was experienced in securing satisfactory sizing. The paper is well sized on the top side but feathers considerably on the wire side.

Most of the precipitated size occurs densely as shown at A, which is the common condition, but occasional fibers may be found with large areas almost entirely without size. On the wire side these conditions are reversed; most of the fibers show sparsely scattered granules of rosin and relatively few areas with densely grouped granules. Nothing similar to the homogeneous deposits as seen in the fiber depressions in Figs. 1 and 3 can be found, or even the larger nearly homogeneous aggregates. Almost all the precipitated rosin is in the form of irregular granules but frequently these are so thickly crowded as to appear to be, and they probably actually are, more or less fused together. The impression is gained that the rosin is relatively heavy and thick as compared with Figs. 7 and 8, where it is thin to extremely thin and light. Since the paper shown in Fig. 7 is well sized and that of Fig. 8 very well sized, this would appear to prove that heavy, thick precipitates are not essential to good sizing.

Fig. 5 shows precipitated rosin size as seen on the top surface of a 100 per cent bleached sulphite, water-marked bond paper, magnified about 620 diameters. This paper was made on a fast-running commercial paper machine at

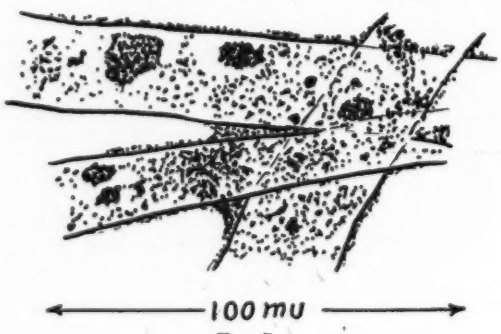

FIG. 7.
Top surface of an all alpha fiber paper. Approximately 620 diameters.

a time when trouble was experienced in securing satisfactory sizing. The paper is well sized on the top side but feathers on the wire side. The conditions shown in Fig. 5 are essentially the same as described under Fig. 4.

Fig. 6, precipitated rosin size as seen on the wire side of a watermarked sulphite bond, the same paper as illustrated in Fig. 5, explains why this side of this paper shows feathering to writing ink, namely, that the sparse covering of rosin particles leaves large areas entirely unprotected.

Fig. 7 shows precepitated rosin size as seen on the top surface of a 100 per cent bleached alpha-pulp paper, magnified about 620 diameters. This paper was made on a slow-running experimental paper machine using two per cent rosin. It is well but not hard sized. Most of the rosin precipitate shows as irregular, separate granules unevenly scattered but not so much so as to leave large areas of the fiber surfaces unprotected. Some, but not many, of the granules are grouped in aggregates and a homogeneous globule rarely appears. The wire side is practically the same as the top side but has a little less of the rosin precipitate in it.

The papers shown in Figs. 3 and 7 were made exactly the same except for the fiber composition.

Fig. 8 shows precipitated rosin size on the top surface of a 100 per cent unbleached kraft wrapping paper of first quality, magnified about 620 diameters. This paper was made on a fast-running commercial paper machine. The paper is very hard sized to writing ink on both sides. The figure shows that the precipitated rosin size on the top surface of kraft wrapping paper is almost exclusively in the form of fine, irregular particles almost densely distributed over the fiber surfaces, leaving practically no parts on the surfaces unprotected. Although there are fewer particles on the wire side than on the top, even so the fibers of the wire side are well protected. It is believed that particles too fine to be distinguished occur in this paper. There are occasional more or less homogeneous aggregates of rosin. In this paper the impression is given that the precipitated rosin particles are thin and not piled on top of each other to give such a thick "layer" as occurs in Figs. 4 and 5.

Fig. 9 shows the precipitated rosin size in a watermarked bleached sulphite ledger paper magnified about 620 diameters. This sheet was made with about two per cent rosin on a fast-running commercial paper machine. It is well sized on both sides. The size occurs in irregular granules

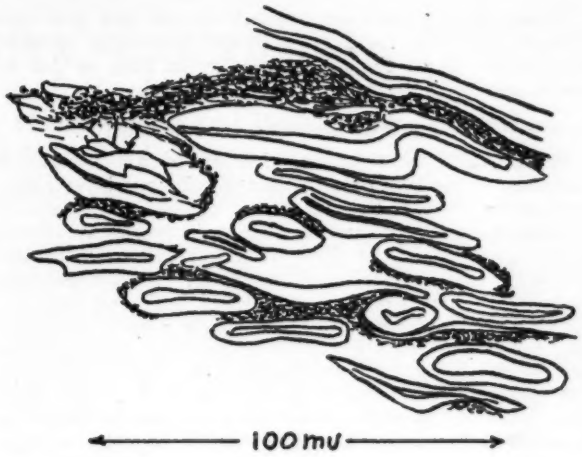

FIG. 9.
Cross section of a sulphite ledger paper. Approximately 620 diameters.

more or less densely packed together. The granules frequently appear to be flattened and may be somewhat fused together. The general impression, however, is that each granule is separate. It is particularly to be noted that where there are large areas entirely without size, that there is a tendency for the size to lie in planes parallel to the surfaces of the paper with other planes containing no rosin, and that there is a very large amount of rosin in the disintegrated (beaten) fiber. The diagram illustrates the condition near the middle of the sheet, the top contains more and larger particles, the wire side shows much less size.

In Fig. 10 is seen solvent rosin size on the top surface of a 100 per cent sulphite paper solvent-sized by the Minton process, magnified about 370 diameters. This paper was sized after being made waterleaf. It was apparently well sized at the time of making but on exposure to sunlight for a few days it became very nearly slack sized.

The figure shows the appearance of "solvent sizing", the deposition of pure rosin from a solution on the evaporation of the organic solvent. The sizing in this paper resembles that produced when sulphuric acid instead of alum is used to precipitate the rosin. The rosin occurs in homogeneous masses of various dimensions and shapes but is mostly in the form of relatively large groups. A large part of the fiber surfaces is not covered by the rosin. When heated, the rosin assumes the shapes of globules as shown in Fig. 11.

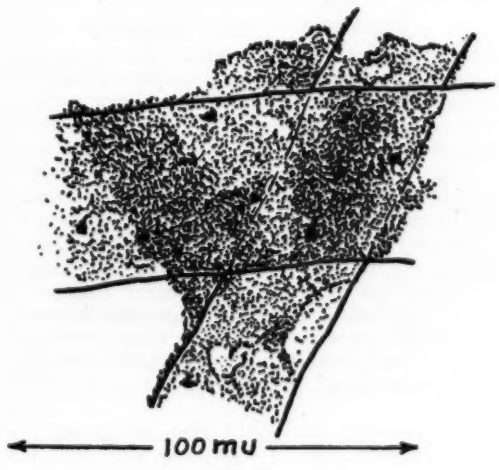

FIG 8.
Top surface of a kraft paper. Approximately 620 diameters.

FIG. 10.
Surface of a solvent-sized paper. Approximately 370 diameters.

When these papers are soaked in cold ten per cent sodium hydroxide for 2 minutes and thoroughly washed with water all of the precipitated rosin size, as far as can be seen with the microscope, is removed.

Discussion of Conditions as Illustrated

Perhaps the most striking feature of all the papers examined is the lack of a distinct, continuous layer either surrounding the individual fibers or filling the spaces between them. On the contrary the rosin precipitate occurs most commonly in the form of individual, more or less widely or closely distributed, irregularly shaped granules of varying dimensions. It is further indicated that the individual particles, even when closely packed together, tend to remain separate and not to fuse into homogeneous masses. When they do form aggregates, these commonly still exhibit the fact that they are composed of individual particles. Only in the case of the solid masses filling the depressions in the sides of some of the rag fibers (Figs. 1 and 3) and in the solvent sized paper (Fig. 10) do homogeneous collections of what appear to be pure rosin occur to any considerable extent.

There seems to be no evidence of a complete coating of each individual fiber as claimed by Klemm (*5*) and others. Filling of the pores of the paper (whatever may be meant by pores) as claimed by Arledter (*1*) at most is incomplete and certainly in papers sized as shown in Fig. 8, which is the most nearly completely sized of all those examined, is apparently negligible.

The best, hardest and most economical sizing would appear to go with a certain minimum amount of rosin in the form of very fine, perhaps ultramicroscopic, particles distributed, as nearly as possible, uniformly on the surfaces of the fibers and fibrillæ. It is not definitely established, but it seems reasonable to believe, that additional rosin precipitate over a certain maximum is undesirable and may even reduce the efficiency of the sizing by the formation of relatively large masses which do not well protect the surfaces and by the formation of dense thick layers which result in subsequent cracking and exposure of the cellulose.

Conditions as found seem more nearly in accord with Schwalbe's claim (*7*) that aluminum hydroxide "coats the rosin particles, prevents them from fusing together on the drying cylinder and protects them from subsequent action of light and air," than the claims of any of the other investigators.

If the colloid theories of Lorenz, Stockight and Klinger, Heuser, Oeman, Strachan and others (*9*) require the formation of unbroken films of either rosin or resinates, it would seem, in the light of what can be demonstrated with the microscope, that these theories are untenable.

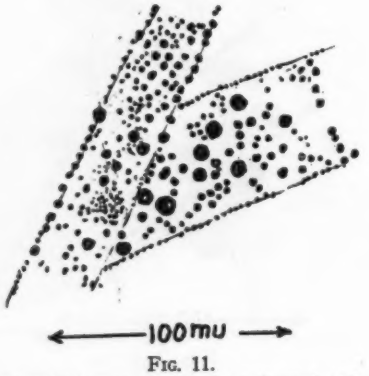

FIG. 11.
Surface of a solvent-sized paper after heating. Approximately 370 diameters.

It appears that sizing, even apparently good sizing, may be secured with large particles or even fused masses of free rosin, but hardest, most lasting and most economical sizing seems to come from precipitated particles, evidently protected from fusing together, of the finest dimensions visible under the microscope or even finer than can be distinguished.

From comparisons of Figs. 4, 5 and 6 with 1 and 3 it is seen that slow-running machines, even when rosin is precipitated in large particles, distribute the precipitate in about the same manner in both sides of the paper; but when the precipitate is coarse, fast-running machines give much less to the wire side than to the top. When the rosin precipitate is very fine there is much less difference between the amount of precipitate on the two sides and if as fine as can be easily distinguished with the microscope, or finer, there is practically no difference between the two sides. The results are reflected in the excellent sizing on both sides of the paper in the case of the finest precipitates as compared with the much feathered wire sides of sheets with coarser precipitation of the rosin.

This investigation demonstrates the importance of particle size and distribution in relation to resulting excellence of rosin sizing and removes these factors from the field of speculation into the realm of fact.

The study of rosin sizing by microscopical investigation is being continued to include the effect upon particle size and distribution of heat, acidity, and alkalinity; relationship to various added materials; correlation with sizing tests; action of solvents; and effect of beating.

Acknowledgments

Much preliminary work in the development of methods for showing rosin size in paper was done in the Laboratories of Economic Botany at Harvard University under the direction of Prof. Oakes Ames. Paper samples with important data concerning composition have been most generously supplied by the Paper Section of the National Bureau of Standards, the Laboratory of Jessie E. Minor, by Mr. P. S. Bolton, and by all the several paper producers and distributors to whom requests were made. Appreciation of this cooperation is hereby expressed. The assistance of my colleagues at Arthur D. Little, Inc., is also gratefully acknowledged.

Literature Cited

(1) F. Arledter, *Papier Ztg.* 32:773 (1907).
(2) J. M. Arnot, *Paper Maker's Monthly J.* 63:142 (1925).
(3) E. A. Georgi, *The Paper Maker* 3, No. 2, 25-27 (1934).
(4) J. H. Graff, *Tech. Assoc. Papers*, Series XIX, No. 1, 305-8 (1936).
(5) P. Klemm, *Paper* 31, No. 13, 11 and No. 14, 11 (1923) from *Woch. f. Papierfabr.*
(6) S. J. Robinson, *Paper Trade J.* 103 No. 7, TS 130-138 (1936).
(7) C. G. Schwalbe, *Papier-Fabr.*, 21:477 (1923).
(8) J. Strachan, *Paper Maker and Brit. Paper Trade J.* 82, No. 3, 4, 5. (1931).
(9) E. Sutermeister. *Tech. Asso. Papers*, Series XIX, No. 1, 460-479. (1936).
(10) B. Wieger, *Paper Trade J.* 100, No. 5, 33 (Aug. 1, 1935).

Netherland India Hopes to Supply Timber to Japanese Paper Industry

The Government of Netherland India through its forestry service is planning to plant in Java 25,000 acres of timber suitable for the manufacture of wood pulp, according to a report to the Commerce Department from its Batavia office.

It is reported locally that the Government believes that a good future market exists in Japan for Netherland Indian timber of this type.

In initiating the cultivation of wood pulp timber, the report points out, the Government is only following the example of the Japanese concern operating a timber concession in Netherland Borneo. This company is reported to be operating at present on the basis of an annual production capacity of 100,000 cubic meters of different types of wood, including wood suitable for the paper industry, it was stated.

The Government has stated that the planting of the present acreage is only a beginning and that if export prospects warrant, the area under cultivation will be greatly increased, according to the report.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Specialties

Containers of Material Such as Long-Fibered Tissue Paper Impregnated With Regenerated Cellulose. Leo A. Goodman, assignor to Visking Corp. U. S. pat. 2,045,349 (June 23, 1936).—A thin sheet of material suitable for use as casings for sausage, etc., is prepared by treating long-fibered cellulosic material such as Yoshino paper with viscose homogeneously to cover and impregnate it and regenerated from the viscose.—A.P.-C.

Containers of Treated Paper or the Like Suitable Holding Lubricating Oils, etc. Wilbur A. Lazier and James H. Werntz, assignors to E. I. du Pont de Nemours and Co. U. S. pat. 2,027,390 (Jan. 14, 1936).—Material for containers such as paper bottles is coated with a composition comprising a substantially hydrogen-saturated ester of a fatty acid having a melting-point of 50 deg. C. or higher such as substantially hydrogen-saturated caster oil, hydrogenated blown drying oils or waxy esters of hydroxy stearic acids with high-molecular-weight alcohols.—A.P.-C.

Paraffin-Impregnated Paper. Société Rosentiel & Cie. Fr. pat. 795,906.—In order to obtain paraffined paper with lines carrying no paraffin, the paper is passed between a pair of rolls, one of which carries in relief the lines which are to be free of paraffin while the other roll has corresponding grooves.—A.P.-C.

Impregnated Paper. Titan Co., Inc. Fr. pat. 793,440 (Jan. 24, 1936).—The transparency of paper, cardboard or other fibrous material impregnated with hydrocarbons, waxes or plastic materials, is reduced by adding a suspension of pigments, particularly titanium pigments, to the waxes, etc. The suspension contains a small amount of a substance having an acid reaction, e. g., higher, fatty acids. —A.P.-C.

Glass Paper. Atlas-Ago Chemische Fabrik A.-G. Fr. pat. 793,405 (Jan. 24, 1936).—A paper resistant to water is made by using cellulose esters as binder for the polishing material and applying to the back of the paper an alcoholic solution of resin to which is added a solvent for the ester used in amount sufficient to penetrate the paper and cause a bond between the ester and the resin.—A.P.-C.

Cigarette Paper. Soc. Anon. des Anciens Etablissments Braunstein Frères. Fr. pat. 798,186 (Feb. 11, 1935). —According to Fr. pat. 732,872, of March 9, 1932, stearic acid in amounts of about 2 per cent are incorporated into the furnish of cigarette paper. The present invention provides for the reduction of the amount of stearic acid to as little as 0.8 per cent with addition of fillers which do not react with the acid (generally oxalic) used to liberate the stearic acid, and which do not have reducing properties when heated, suitably kaolin, white metallic oxides, finely ground silica, asbestos, and preferably titanium dioxide. —A.P.-C.

The Metallization of Paper or Board. A. Matagrin. Papeterie 58: 301-302, 346-350, 542, 545 (April 10, 25, June 25, 1936).—A general description and discussion of present day practice.—A.P.-C.

Special Working Conditions in the Manufacture of Thin Sulphite Papers. Anon. Papeterie 58:633-634 (July 25, 1936).—Practical operating directions.—A.P.-C.

Transparent Wrapping Materials. Anon. Pulp Paper Mag. Can. 37:375-378 (June, 1936).—A review of the manufacture and properties of cellulose films that compete with paper, with bibliography of 56 references.—A.P.-C.

Coloring and Flameproofing Material. Frederick W. Hochstetter. U. S. pat. 2,045,139 (June 23, 1936).—A composition for simultaneously flameproofing and dyeing cellulosic materials consists of an aqueous solution prepared with meta-gelatine, ammonium sulphate, ammonium carbonate, boric acid, zinc sulphate (or other mordant), 2 per cent neutral lime soap suspension containing 2 per cent starch and sufficient acidified dye solution to produce the desired color.—A.P.-C.

Decorative Wrapping Paper. Elbert A. Corbin, Jr., assignor of one-half to William C. Biddle. U. S. pat. 2,037,008 (April 14, 1936).—The under side of a thin sheet of opaque, unfilled, printed tissue is treated with a penetrating, transparent and waterproof varnish, the treated tissue is superposed on a lustrous backing such as a metal foil and the upper side of the tissue is then treated with the varnish.—A.P.-C.

Wrapper and Method of Making the Same. Ralph A. Hayward, assignor to Kalamazoo Vegetable Parchment Co. U. S. pat. 2,045,852 (June 30, 1936).—Printed waxed paper suitable for wrapping foodstuffs is obtained by: (1) printing a ground color on a smooth-surfaced paper with a water-soluble ink which is of such low water content as to be insufficient to cause appreciable expansion or wrinkling; (2) drying; (3) printing a desired decorative effect; (4) applying a film of wax, at least to the printed side, preferably by passing through a wax bath in known manner.—A.P.-C.

Indented Shock-Absorbing Cushioning or Packing Paper. John E. Kieffer. U. S. pat. 2,042,470 (June 2, 1936).—In shock-absorbing cushioning or packing paper one or both surfaces of which are provided with more or less closely spaced protuberances or indentations, the latter are arranged so that they are in substantial contact along two intersecting lines, preferably the length and width of the sheet or the two diagonals.—A.P.-C.

Means and Method for Manufacturing Duplicator Sheets. Louis J. Sauer, assignor to Ditto, Inc. U. S. pat. 2,038,607 (April 28, 1936).—Composition coated strips are manufactured by passing the strip through an impregnating solution to which lacquer will adhere, squeezing the surplus solution from the strip, simultaneously heating and smoothing both sides of the strip by pressure, passing the heated strip through a lacquer solution to coat both sides, simultaneously smoothing the lacquer on both sides to a predetermined thickness, drying the strip, applying an adhesive to the lacquer, and applying a composition to the adhesive while maintaining the strip at substantially the temperature of the applied composition.—A.P.-C.

Method of Weatherproofing Shingles. Maurice L. Caton, assignor to The Patent and Licensing Corp. U. S. pat. 2,039,776 (May 5, 1936).—A treating liquid is applied

to one face and to the butt end of shingles while they are conveyed flatwise in a substantially horizontal plane. The shingles are then rotated into a vertical plane and a treating liquid is applied to the other face of the shingles while they are in the vertical plane.—A.P.-C.

Heat Insulation for Walls or Buildings. Frederick Weyerhauser and John S. Busch, assignors to Wood Conversion Co. U. S. pat. 2,030,668 (Feb. 11, 1936).—A flexible creped sheet liner, such as aluminum foil or asphalted paper, impervious to moisture, is secured to one face of a core material such as a felted wood fiber, and a flexible creped sheet of moisture-pervious material such as perforated asphalt paper is secured to the other side of the core.—A.P.-C.

Roofing and Siding. John A. Topping. U. S. pat. 2,045,423 (June 23, 1936).—A roofing or siding strip comprises a felt base saturated with waterproofing material coated over its entire upper surface with asphalt in which is embedded granular surfacing material. The portion of the surface exposed to the weather is given a substantial thickening and weighting overlay coating of asphalt and granular surfacing, except for a narrow thick-edge simulating margin along the lower edge.—A.P.-C.

Method of Producing Insulating Mats. William Gerb U. S. pat. 2,045,384 (June 23, 1936).—In a fibrous web projections are formed in such a manner that the structure of the projecting portions is loosened, resulting in an increase in the heat-insulating and sound-deadening properties of the mats.—A.P.-C.

Decalcomania Paper. John MacLaurin. U. S. pat. 2,047,978 (July 21, 1936).—Smooth, uniform coatings that bond securely to surfaces such as aluminum are obtained by incorporating into the coatings from 5 per cent to 50 per cent of soluble alkali alginates, based on the dry weight of the coating materials.—A.P.-C.

Waterproofing Composition and Process. John R. Hubbard, assignor to Peter Cooper Corp. U. S. pat. 2,043,324 (June 9, 1936).—Paper that has been coated or impregnated with a protein sizing or adhesive (such as casein or glue) is waterproofed by treatment with a solution of an inorganic aluminum salt at a pH of 4.1 to 4.2.—A.P.-C.

Decalcomania Paper. John MacLaurin. U. S. pat. 2,047,700 (July 14, 1936).—A "slide off" decalcomania paper is produced by applying a coating of starch to one side of a porous backing sheet, drying the coating, applying a coating of water-soluble gum such as dextrine over the starch coating, and securing a sheet of cellophane thereto. —A.P.-C.

Process and Apparatus for Forming Tapered Fibrous Units. Floyd W. Adams. assignor to The Barrett Co. U. S. pat. 2,048,045 (July 21, 1936).—A tapered felt unit is made in a single operation by supplying pulp to a papermaking wire maintained in a plane inclined to the horizontal. The angle of taper can be varied by changing the angle of inclination of the wire.—A.P.-C.

Siding Element and Process of Making the Same. Stuart P. Miller, assignor of The Barrett Co. U. S. pat. 2,047,741 and 2,047,742 (July 14, 1936).— *No. 2,047,741*—The weather side of a coated felt base is surfaced over the body or unexposed portion with mineral grit and over the exposed or tab portion with non-mineral material. An overlay coating of water-proofing material is applied over the mineral material, and is in turn surfaced with mineral grit contrasting in color with the mineral grit on the body portion of the base. *No. 2,047,742*—Carbonaceous surfacing material (such as ground coke, bone charcoal, vegetable carbon, etc.) is used for covering the seal-back coatings on the weather-exposed side of the element.—A.P.-C.

Laminated Panel. Herbert J. Woodall and Meredith S. Randall, assignors to Woodall Industries, Inc. U. S. pat. 2,028,962 (Jan. 28, 1936).—A laminated panel structure comprises a layer of loosely integrated fibrous material possessing high sound-insulating properties, an outer layer of thermoplastic asphalt impregnated fibrous self-supporting material responsive to heat and pressure to assume and permanently retain a deformed shape permanently secured to one side of the first layer, and an outer layer of flexible deformable cushioning material secured to the opposite side of the first layer.—A.P.-C.

Method of Making Shingle Strips. Lester Kirschbraun, assignor to The Patent and Licensing Corp. U. S. pat. 2,043,545 (June 9, 1936).—In shingle strips having a heavier coating of asphalt and coarser granular surfacing material on the weather-exposed portion than on the unexposed portion, spaced narrow transverse bands of the heavier asphalt coating and coarser surfacing grit are applied so that, when the strips are applied on a roof, these narrow bands will underlie the cut-out portions defining the shingle-simulating tabs of the overlying strip.—A.P.-C.

Manufacture of Bituminized Felts. Milton O. Schur and Walter L. Hearn, assignors to Brown Co. U. S. pat. 2,049,978 (Aug. 4, 1936).—The bituminized sheet is humidified, preferably by spraying with a fine mist, with sufficient moisture to impart maximum strength properties. —A.P.-C.

Thermal Insulation. John Campbell and Robert G. Quinn, assignors to International Paper Co. U. S. pat. 2,042,586 (June 2, 1936).—Corrugated paper sheets are superposed, each sheet being saturated with up to 50 per cent of its weight of asphalt capable of forming a rigid film by which the corrugations will retain their shape, the flutes of adjacent sheets having substantially point contact with each other, being laid crosswise of each other.—A.P.-C.

Facial or Cleansing Tissues. Charles A. Fourness and James T. Whalen, assignors to International Cellucotton Products Co. U. S. pat. 2,043,351 (June 9, 1936).—Two or more webs of creped tissue are passed simultaneously between a pair of calender rolls to crush some of the striations of the creping and then between a hard embossing roll (suitably about 9.5 inches in diameter) having a small pattern which effects embossing not materially coarser than the crepings in the webs, and a resilient platen roll (suitably about 14 inches in diameter).—A.P.-C.

Shoe Stiffener Material. Stanley P. Lovell, assignor to Beckwith Manufacturing Co. U. S. pat. 2,036,588 (April 7, 1936).—A fibrous base such as a felt is impregnated with nitrocellulose and boric acid, suitably porous for treatment with nitrocellulose solvents.—A.P.-C.

Leather Substitute. Albert J. Hanley and Roland B. Respess, assignors to Respro Inc. U. S. pat. 2,033,099 (March 3, 1936).—A fibrous sheet material is saturated with a rubber-composition solution, dried, calendered, coated on one or both sides with a rubber composition containing a blowing agent such as ammonium carbonate or stearic acid and sodium bicarbonate and short-length fibers, heated to effect blowing and form numerous fine gas spaces, vulcanized and coated with a surface layer material.—A.P.-C.

Moistureproof Cigarette. Nathan Sulzberger. U. S. pat. 2,033,791 (March 10, 1936).—A cigarette wrapper is impregnated at both ends with a dilute solution containing nitro-cellulose and paraffin.—A.P.-C.

Abrasive Sheet Material. Romie L. Melton and Raymond C. Benner, assignors to The Carborundum Co. U. S. pat. 2,033,991 (March 17, 1936).—Abrasive particles are

projected by electrostatic means onto an adhesively coated web, and are simultaneously subjected to the orienting influence of a magnetic field to obtain maximum orientation of the particles.—A.P.-C.

Paper and Process for the Manufacture of Same. Leo Liberthson, assignor to L. Sonneborn Sons, Inc. U. S. pat. 2,047,975 (July 21, 1936).—Fungus-resistant paper is produced by impregnating with a hydrocarbon in which is dissolved an oil-soluble copper compound.—A.P.-C.

Synthetic-Resin Impregnated Paper. Alphonse Gams, Gustave Widner and Karl Frey, assignors to Ciba Products Corp. U. S. pat. 2,031,260 (Feb. 18,1936).—For producing a moldable sheet material with which an infusible but thermoplastic reaction product of aniline and formaldehyde is incorporated, an acid solution is formed by the reaction of 1 molecule of aniline with more than 1 molecule formaldehyde in the presence of at least about 1 molecule of an inorganic acid such as hydrochloric acid, and paper pulp is saturated with the solution thus prepared, the condensation product is precipitated with alkali, such as caustic soda, upon and around the fibers of the pulp, and a paper is formed from the pulp.—A.P.-C.

Shoe-Stiffening Material. Stanley P. Lovell, assignor to Beckwith Manufacturing Co. U. S. pat. 2,040,320 (May 12, 1936).—A porous fibrous foundation material such as felt has incorporated in it a mixture of finely divided cellulose ester, and a synthetic phthalate, glyptal, vinyl or "plioform" resin, associated so as to permit a solvent for the ester to penetrate the material and effect a colloidizing of the ester.—A.P.-C

Sheet Material for Gaskets and Packings. John H. Victor, Benjamin J. Victor and William A. Heinze, assignors to Victor Manufacturing and Gasket Co. U. S. pat. 2,040,348 (May 12, 1936).—Asbestos millboard is impregnated with a composition formed from 50 to 90 per cent of China wood oil, 5 to 25 per cent of linseed oil, 5 to 30 per cent of turpentine and 1 to 2 per cent of metallic resinates.—A.P.-C.

Apparatus for Making Artificial Leather. John B. Catlin and Rudolf A. Moravek, assignors to Paper Patents Co. U. S. pat. 2,049,892 (Aug. 4, 1936).—A number of plies of creped paper are passed simultaneously through a series of vertically disposed pairs of press rolls, the pressure between each pair of rolls being adjustable independently. Suitable impregnating liquid, such as rubber latex, is delivered into the nip of the top pair of rolls.—A.P.-C.

Manufacture of Absorbent Cloth-Like Paper. George A. Richter and Milton O. Schur, assignors to Brown Co. U. S. pat. 2,048,293 (July 21, 1936).—Glycerin (up to 30 per cent by weight) is incorporated in paper made from ungelatinized cellulose and treated so that it contains regenerated cellulose uniformly distributed therethrough.—A.P.-C.

Porous, Long-Fibered, Non-Hydrated Paper and Process of Making the Same. Fay H. Osborne, assignor to C. H. Dexter and Sons, Inc. U. S. pat. 2,045,095 and 2,045,096 (June 23, 1936).—Vegetable fibers of the Musa family, and more particularly of *Musa textilis* are separated by drastic alkaline cooking; the washed fiber is delivered at a consistency of about 0.002 per cent to a relatively coarse-mesh wire (about 50 meshes to the inch) travelling upwardly at an angle of preferably about 45 deg. to the horizontal, and then downwardly over a greater distance to the couch roll. The sheet is pressed and dried in known manner. *No. 2,045,095* covers the process and *No. 2,045,096* the product.—A.P.-C.

Manufacture of Saturated Fibrous Products. Izador J. Novak, assignor to Raybestos-Manhattan, Inc. U. S. pat. 2,049,469 (Aug. 4, 1936).—A wet fibrous sheet as it comes from the paper machine is passed through a saturating bath where the web distends and absorbs saturant, the web being supported to permit distention while preventing disintegration. The saturated web may be couched or pressed as it emerges from the bath, expressing a quantity of its liquid content and, immediately after pressing, is free to again distend in the presence of a pool of saturating liquid. The distended web may again be couched and pressed, and subsequently dried.—A.P.-C.

Method and Apparatus for Making Abrasive Paper. Raymond C. Benner, Henry P. Kirchner and Romie L. Melton, assignors to The Carborundum Co. U. S. pat. 2,049,535 (Aug. 4, 1936).—In order to control the viscosity and uniformity of the layer of adhesive, the adhesive-coated web is subjected to the action of an atmosphere maintained at such a temperature and vapor pressure of the solvent that the adhesive is in a satisfactory condition for the reception of the abrasive particles.—A.P.-C.

Manufacture of Impregnated Fiber Articles. George A. Richter and Milton O. Schur, assignors to Brown Co. U. S. pat. 2,045,410 (June 23, 1936).—Fibrous material is treated with regenerated cellulose (viscose) in such a way that its porosity is not greatly decreased and, after drying, is impregnated with asphalt, wax, resin, or other heat-fusible material. Alternatively, the viscose may be mixed directly with the impregnating material.—A.P.-C.

Abrasive Sheet and Process of Making the Same. Orello S. Buckner, assignor to Behr-Manning Corp. U. S. pat. 2,027,087 (Jan. 7, 1936).—A sheet having an adhesive surface is placed in a magnetic field so that the lines of force pass approximately perpendicularly therethrough, and magnetically coated elongated grains of abrasive materials are showered on to the surface.—A.P.-C.

Abrasive Sheet. Elmer C. Schacht, assignor to Behr-Manning Corp. U. S. pats. 2,027,307 to 2,027,309 (Jan. 7, 1936).—*No. 2,027,307*—Finely divided abrasive particles are deposited on to a sheet while under the influence of an electrical field which controls their position. *No. 2,027,308*—This invention provides means for supporting an adhesively coated sheet about which an electrical field is formed by means of terminals of opposite polarity on opposite sides of the sheet, the terminals co-operating to narrow and intensify the field and converge it at the point at which finely divided magnetically coating grains of abrasive materials are delivered thereon. *No. 2,027,309*—The patent claims as new an abrasive sheet in which elongated abrasive particles are positioned relatively to one another by electric action, substantially all the particles being substantially uniformly spaced apart with the major axes substantially perpendicular to the abrading surface.—A.P.-C.

Paper Material Carrying a Resin of Petroleum Origin. Carleton Ellis, assignor to Standard Oil Development Co. U. S. pat. 2,042,299 (May 26, 1936).—Synthetic resins obtained by heat treatment from gas oil, either alone or in admixture with other resins (including semi-resins of petroleum origin or the natural petroleum oil resins themselves) are used for impregnating porous paper.—A.P.-C.

Manufacture of Pigmented Paper. John J. Healy, Jr., assignor to Merrimac Chemical Co. U.S. pat. 2,042,338 (May 26, 1936).—Discoloration and similar objectionable deterioration of paper containing a zinc sulphide filler or pigment, and where aluminum sulphate is used in sizing, is prevented by addtion of sodium aluminate to bring the pH value within the range of 4.9 to 7.6.—A.P.-C.

Method of Feeding Paper to Corrugating Rolls. Herbert A. Kidd, assignor to The Mead Corp. U. S. pat. 2,044,987 (June 23, 1936).—The web on its way from the supply roll to the corrugating rolls wraps around a considerable portion of a feed roll which is driven at a slightly

higher peripheral speed than that required by the corrugating rolls. Before and after the feed roll the paper passes over light guide rolls, the bearings of which are mounted on springs. Variations in the tension of the web between the feed and corrugating rolls affects the frictional engagement and slippage between the feed roll and the sheet, so that the latter is automatically supplied to the corrugating rolls at the proper speed.—A.P.-C.

Manufacture of Rubber-Reinforced Waterlaid Fiber Webs. Milton O. Schur, assignor to Brown Co. U. S. pat. 2,041,968 (May 26, 1936).—Rubber is precipitated from latex in the substantial absence of fibers, and the aqueous rubber suspension is added to the stream of fibrous stock on its way to the paper machine.—A.P.-C.

Corrugating Machine. George W. Swift, Jr., assignor to George W. Swift, Inc. U. S. pat. 2,043,635 (June 9, 1936).—The invention provides improvements in the construction of stripping and guiding members used in conjunction with paper—or board—corrugating and facing mechanism permitting of making narrower groves in the corrugating rolls, and also provides for the application of adhesive to the areas on the peaks of the corrugations which otherwise would be bare of adhesive on account of the grooves in the corrugating rolls.—A.P.-C.

Multiple Impregnating Device for Paper Manufacture. Izador J. Novak, assignor to Raybestos-Manhattan, Inc. U. S. pat. 2,044,012 (June 16, 1936).—A freshly-formed moist web of paper is passed through a series of impregnating baths and dried. Following each bath the web is passed between squeeze rolls.—A.P.-C.

Paper Product and Method of Making the Same. Benjamin Asnes, assignor to Dennison Manufacturing Co. U. S. pat. 2,046,763 (July 7, 1936).—A soft, flexible sheet of paper, of open formation and consisting of very pure fiber (alpha fiber or cotton) is treated with a solution of gel-forming albuminous adhesive, such as gelatin or glue, in such a manner as to bond the fibers at their points of contact without appreciable filling of the interstices.—A.P.-C.

Preparation of Protective Envelopes of Paper for Containing Food. W. W. Groves assignee of I. G. Farbenindustrie A.-G. Brit. pat. 436,891 (March 12, 1934).—A colorless or slightly colored substance having affinity for the sheet, and capable of absorbing ultra-violet light, is incorporated; an antioxidant (quinol) may be added. *E. g.*, cellulose hydrate is impregnated with urea from sodium mono - para - aminobenzoyl-para-phenylenediaminesulphonate, or sodium di-meta-aminobenzamidostilbenedisulphonate, or gelatin is impregnated with 2, 3-hydroxynaphthoylaminosulpho-alphanapthalide.—A.P.-C.

Production of Fibrous Material in Layer Form, Suitable for Heat-Insulation or Packing Purposes. F. B. Dehn assignee of Cellufoam Corp. Brit. pat. 442-045 (May 23, 1934).—Cellulose or other fibers are hydrated to gelatinize the surface, and prior to or during this treatment moisture- and fire-proofing agents (dispersed wax and boric acid) are incorporated; after such treatment a foam-producing agent (saponin) is added. The mass is then spread as a layer and the water removed by suction of sufficient intensity to compact only the surface fibers.—A.P.-C.

Writing Paper With White Copying Preparation. G. Guggenbuhl. Brit. pat. 440,935 (July 11, 1935).—The underside of the paper is coated with a white preparation which is transferable to dark paper when the front is written on by hand or typewriter.—A.P.-C.

Production of a Protective Coating of Hard Rubber on Paper, Pasteboard and the Like. E. Sachs. Brit. pat. 440,368 (June 29, 1934).—A porous base material, after drying, is impregnated under pressure with a hard resin, *e.g.*, hardened rosin or phenol-formaldehyde type resin, treated with a layer of rubber mixture containing not less than 15 per cent of sulphur, and vulcanized under pressure. If desired, reinforcing materials (metal strips, etc.) may be embedded in the base material or the coating.—A.P.-C.

Bitumenized Felt. F. Werner. Belg. pat. 412,185 (Dec. 31, 1935).—The edges are raised above the plane of the sheet and are re-enforced by means of a superposed layer.—A.P.-C.

Tissue Paper. Karl v. Csipkay, Rosa v. Csipkay, Franz Mikuleczky, Elly Mikuleczky and Ludwig v. Piette-Rivage. Brit. pat. 439,024 (Nov. 27, 1935).—To paper pulp in the hollander, mixing trough, etc., there is added natural or artificial rubber, *e.g.*, as an aqueous emulsion, with vulcanizers and (or) vulcanizing accelerators, the pulp being formed into tissue paper or carbon or indigo duplicating paper, which may be creped and may contain 2 to 3% rubber.—A.P.-C.

Production of a Mirror Polish on Paper and Similar Material. Atlas Ago Chem. Fabr. A.-G. Brit. pat. 439,460 (April 10, 1935).—Highly calendered paper is coated with a fusible material (*e.g.*, wax, resin, rubber), then with a layer of heat-resistant varnish, and finally heated by lightly pressing against a mirror-polished cylinder.—A.P.-C.

Manufacture of Artificial Leather. N. V. Vereenigd Industrieel Bezit No. 7. Brit. pat. 439,108 (May 22, 1934).—A loosely-coherent fleece of cellulose fibers, after boiling with aqueous caustic soda, is sprayed with an adhesive (rubber dispersion free from fillers) to cause the fibers to stick together without diminishing their permeability, and is then impregnated with a non-viscous dispersion of rubber containing fillers so that the final product contains from 38 to 60% of rubber. After drying, the material is calendered and vulcanized.—A.P.-C.

Manufacture of Artificial Leather. A. B. Unger, C. A. Vorsteher, Jr. and Sr. Brit. pat. 439,340 (Feb. 22, 1935).—Fiber fleece is impregnated with an aqueous rubber dispersion while being alternately compressed and relieved from pressure in rapid succession. After coagulation of the rubber, the water is removed from the material by pressure or drying.—A.P.-C.

Creping Process and Apparatus. Zellstofffabrik Waldhof and R. Haas. Belg. pat. 412,217 (Dec. 31, 1935).—The sheet is held between two deformable bodies and is contracted in the desired direction by means of these two bodies with application of pressure on the sides.—A.P.-C.

Manufacture of Compressed Sheet Material Having an Opaque Decorative Surface. Society for Chemical Industry in Basle. Brit. pat. 443,449 (Nov. 1, 1934).—Paper, rendered opaque by inclusion in it of 10 to 40% of a pigment (*e.g.*, lithopone, zinc sulphide), receives a decorative design. Its decorated surface may then be varnished, or impregnated with a binding agent (benzene solution of styrene resin, acetone solution of acetylcellulose), and united with a backing by heat-pressing between chromium-plated plates.—A.P.-C.

Impregnating Paper With Resinous Binders. Gerald H. Mains, assignor to Canadian Westinghouse Co., Ltd. Can. pat. 357,298 (April 21, 1936).—Paper is treated with a weak solution of size, *e.g.*, by weight 3 to 5% of animal glue, 2 to 3% of formalin, 95 to 92% of water, to increase its wet tensile strength while maintaining its porosity, dried and impregnated with a water-soluble resin, such as urea or thiourea resin. The solution is allowed to penetrate the paper to make up to 30 to 70% by weight of the product.—A.P.-C.

Chemical Stabilization of Paper. Ontario Research Foundation assignees of O. J. Schierholtz. Brit. pat. 443,534 (June 27, 1935).—Paper, which may contain sizing, is sprayed with, or immersed in, a dilute aqueous solution of an alkaline-earth bicarbonate (*e.g.*, 0.15 to 0.2% aqueous barium bicarbonate). It is claimed that the paper is rendered more resistant to ageing and will not tarnish metals.—A.P.-C.

Preparation of Safety Paper. Imperial Chemical Industries, Ltd., G. Paine and J. A. Radley. Brit. pat. 442,530 (Aug. 8, 1934).—Paper or pulp is "dyed" with 4,4′-di(benzamido)stilbeine-2,2′-disulphonic acid or substituted derivatives thereof, *e.g.*, containing para-amino, ortho-chloro, or para-methyl groups in the benzyl residues. The paper, when viewed by filtered ultra-violet light, shows fluorescence which is difficult to remove.—A.P.-C.

Waterproofing and Fireproofing Paper. Yvonne A. R. Leroy (Née Ombredane), assignor to Brick Trust, Ltd. Brit. pat. 440,026 (Dec. 16, 1935).—Fibrous materials are impregnated with an insoluble salt of a higher fatty acid, *e.g.*, by treatment successively with the soluble salt of the acid and a metallic salt that precipitates the acid, and the impregnated material is treated at 30° to 75° C. with a fireproofing solution and with a solution of gelatin or other albuminous substance that is hardened, *e.g.*, by formaldehyde.—A.P.-C.

Security Paper. Stanley B. Chamberlain. Brit. pat. 440,421 (Dec. 23, 1935).—Thread or filaments of rayon, etc., coated or impregnated with a noncorrodible metal, *e.g.*, gold, silver, are introduced during the manufacture of paper to be used for bank notes, etc.—A.P.-C.

Production of Saturated Fibrous Sheet Material. A. H. Stevens, assignee of Raybestos Co. Brit. pat. 442,002 (April 28, 1934).—The continuous fibrous web (paper or board, etc.), immediately after formation on the paper machine, is saturated with rubber latex by passing through a bath of the solutions. Means are provided for preserving it against disintegration.—A.P.-C.

Paper for Toweling. Brown Co. Brit. pat. 441,347, (Jan. 17, 1936).—Absorbent paper is given high wet-strength without much loss of absorptivity by impregnating with a dilute solution of albuminous adhesive, *e.g.*, not more than 5% glue, gelatin, etc., and drying to leave thin adhesive coatings on the fibers. A little softening material, such as glycerin, soap, alcohol, or preservative such as sodium ortho-phenylphenate, may be used; or the paper may be softened by a doctor blade.—A.P.-C.

Waterproofing Sheets of Cellulose Materials. British "New Wrap" Co., Ltd. Fr. pat. 792,961 (Jan. 14, 1936). —A solution in a volatile solvent of a cellulosic base such as nitrocellulose or cellulose acetate and rubber or chlorinated rubber (not less than 8 parts for 100 parts of base) is used.—A.P.-C.

Production of Cellulose Masses. British Thomson-Houston Co. Brit. pat. 442,012 (July 26, 1934).—Air-dried cellulose is treated with an aqueous dispersion of a polymerized acrylic acid compound to bring it to the "swollen" conditions, which is maintained on drying; the product has also reduced hygroscopicity.—A.P.-C.

Boards

Corrugated Board for Wrapping and Advertising Purposes. K. Fiedler. Papier-Ztg. 61, No. 52:1013-1014, 1016 (June 27, 1936).—A brief account is given of the historic development of corrugated board. Reference is made to different patterns of corrugations and various applications for wrapping all kinds of articles, as well as to testing methods for shipment by rail. Corrugated board can be printed and used for advertisements; different methods are described.—C. J. W.

Leather, Leather Substitutes and Artificial Leather. Papier-Ztg. 61, No. 43:869-872; No. 44:887-888 (May 27, 30, 1936).—A discussion of the properties of leather, leather splits and genuine parchment, the processes of tanning and graining, etc. Brief reference is made to artificial leather, which consists of a base tissue and a waterproof cellulose coat. The differentiation between genuine and artificial leather in manufactured goods is not always an easy matter and requires considerable experience, especially since the "feel" is often misleading. The safest method is scraping a small sample in an inconspicuous place, which will reveal the two separate layers in the case of the synthetic material.—C.J.W.

Jacquard Board. Papier-Ztg. 61, No. 53:1027-1028; No. 55:1058-1059 (July 1, 8, 1936).—The methods of manufacturing jacquard board and the demands placed upon the finished product are discussed. One of the chief requirements is minimum stretching or shrinking caused by the frequent temperature and humidity changes in the weaving mills. The latter have to work at high relative humidities for keeping the textile fibers flexible. Choice of appropriate raw materials (no filled or coated waste paper) and suitable sizing, the material being beaten to the extent that it contains no knots without being too slow, as well as careful drying at temperatures not exceeding 50° C., will help to obtain satisfactory results. The Italian textile industry is said to have solved the problem by using simple strawboard for this purpose.—C. J. W.

Reactivity of Zinc Chloride Solutions (in the Production of Fiberboard). A. C. Giller and E. V. Lipshitz. Tzentral. Nauch.-Issledovatel. Inst. Humazhnoi Prom. Materialui 1935, No. 2:134-150; C. A. 30:5036.—The effects of acidity, alkalinity and the presence of organic and inorganic impurities on the parchmentizing and agglutinating properties of zinc chloride solutions in the production of fibreboard were studied. Solutions of zinc chloride (d. 1.9) were treated with various amounts of hydrochloric acid, zinc oxide, ferrous chloride, ammonium chloride and calcium chloride and with solutions of cellulose and products of hydrolytic decomposition of cellulose and glucose commonly present in spent zinc chloride solutions. These solutions were used in the preparation by hand and testing of fibreboards. The parchmentizing and agglutinating powers for paper of zinc chloride solutions containing more than 1.12 ferrous chloride are greatly impaired, while at a concentration of 2% ferrous chloride they become inactive and unsuited for the production of fibreboard. The presence of ammonium chloride up to 10% reduces the density and viscosity of zinc chloride solutions, but does not affect their reactivity and the mechanical properties of the resulting fiberboard. Calcium chloride decreases the density and viscosity of zinc chloride solutions and those with 2.5% calcium chloride become inactive and useless in the production of fibreboard. High acidity (1.5 cc. of 0.1 *N* sodium hydroxide per 10 cc. zinc chloride solution) of fresh solutions and high alkalinity (12 cc. of 0.1 *N* hydrochloric acid per 10 cc. of solution) of spent solutions do not entirely decrease the reactivity of zinc chloride solutions but give fiberboards of low quality in respect to mechanical strength, permeability to water and physical appearance. Products of hydrolytic decomposition of cellulose (obtained by heating cotton wool at 120° for 1 and 3 hours and at 130° for 1, 2 and 3 hours in concentrated zinc chloride solutions) reduce the activity of the chloride and the mechanical strength of the fiberboards. The addition of dissolved cellulose does not appreciably affect the reactivity of the chloride but impairs the external appearance of the board, increases its permeability and improves its mechanical properties.—C. J. W.

Causes of Decreasing Reactivity of Acting Zinc Chloride Solutions and Attempts at Overcoming and Eliminating Them. F. I. Korchemkin and E. D. Nikiforova. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom. Materialui 1935, No. 2:151-170; C. A. 30:5030.—In agreement with the results of the preceding study, it is shown that calcium and ferrous chlorides decrease and even destroy the agglutinating power of zinc chloride solutions (d. 1.97) for paper in the production of fiberboard. The source of contamination of the chloride solutions with calcium chloride is partly water and chiefly the cement diffusers. Calcium chloride is removed from the solutions by adding zinc sulphate and filtering from the calcium sulphate. Cupric and magnesium chlorides up to 3% do not affect the reactivity of the zinc chloride and the degree of lamination of paper. While the presence of free hydrochloric acid decreases the agglutinating power of the chloride solutions for parchmentized paper, an increased alkalinity has no effect upon it. A complete separation of organic matter from inactive ("fatigued") zinc chloride solutions has no effect on their reactivity.—C.J.W.

Sulphite Pulp Screenings for the Manufacture of Board. Eberhard Oswald Muller, Wochbl, Papierfabr. 67, No. 20:372-375 (May 16, 1936).—The economic utilization of the screenings from sulphite pulp for the manufacture of board is viewed as desirable for Germany. The screenings, consisting of knots, pieces of partially cooked wood, etc., constitute from 2 to 8% of the pulp, depending on the cooking method and the wood used. The defibering of the screenings in kollergangs, rod mills and several other types of beaters are described. The manufacture of certain grades of board are briefly mentioned. The high power consumption is the greatest obstacle to the use of screenings.—J.F.O.

Pasted Boards. Wochbl. Papierfabr. 67, No. 22:412-413 (May 30, 1936).—The author briefly gives the history of pasted boards, then mentions the kinds. Potato starch was used first as an adhesive, and then silicate of soda with a $Na_2O : SiO_2$ ratio of 1 : 3.25. The temperature of the layers of board being pasted their moisture content is of great importance.—J.F.O.

Fabrication of Leather Boards and Thinner Leather Sheets. William T. Doyle, assignor to Sturtevant Mill Co. U. S. pat. 2,047,136 (July 7, 1936).—Tanned leather scrap is passed through a hammer mill, the discharge openings in the casing of which are relatively large (suitably one inch long by one-quarter inch wide). On leaving the mill the material is subjected to air-classifying to separate it into usable and coarse material; the former is formed into leather board on a fourdrinier machine and the latter is returned to the mill for further treatment.—A.P.-C.

Use of Asphaltenes for Making Wall Boards for Heat Insulation. Stewart C. Fulton and Vladimir Kalichevsky, assignors to Standard Oil Development Co. U. S. pat. 2,035,122 (March 24, 1936).—Asphaltenes are incorporated with suitable binders such as cement, etc., and with fibrous material, such as burlap, cotton, asbestos, etc., and the mixture is subjected to pressure.—A.P.-C.

Insulating Board. Philip W. Codwise, assignor to Certain-Teed Products Corp. U. S. pat. 2,041,696 (May 26, 1936).—Diatomaceous earth is incorporated in a laminated fiber board furnish, so that the outer plies contain somewhat more diatomaceous earth than the inner plies.—A.P.-C.

Method and Machine for Making Diagonally Corrugated Board. Edgar Watson, assignor to The Nelson Corp. U. S. pat. 2,042,243 (May 26, 1936).—Diagonally corrugated board is produced by decreasing the width of the sheet successively from the center thereof, forming diagonal folds or corrugations therein, and maintaining the corrugations while applying a liner on one or both faces of the corrugated sheet.—A.P.-C.

Process of Manufacturing Hard Board. Fergus A. Irvine. U. S. pat. 2,044,213 (June 16, 1936).—Bagasse is softened by digestion, refined mechanically to a fibrous state, mixed with a polymerizable substance (suitably up to 12% of tung oil), formed into a sheet and pressed in a heated press until the tung oil is polymerized.—A.P.-C.

Paperboard. Fred L. Buchanan and Reynolds Guyer, assignors to Waldorf Paper Products Co. U. S. pat. 2,042,501 (June 2, 1936).—The board comprises a body portion that is dyed black, green, or some other color that absorbs light rays over a range of wave-lengths from 136 to 7700 Angstrom units. The body portion has on one side a white or colored facing, which is preferably calendered and may be decoratively printed, and on the other a paraffin-surfaced liner.—A.P.-C.

Corrugated Sheet and Process for Making Same. Frederick W. Schroder and Martin Willis, assignors to R. J. Dorn Co., Inc. U. S. pat. 2,041,967 (May 26, 1936).—A mixture of asbestos, cement and water is deposited on a travelling, endless coarse fabric or felt, which is passed between a pair of corrugated rolls, and the sheet is removed from the felt.—A. P.—C.

Utilization of Bagasse. VI. Physical Properties of Celotex (4). Ignition Point. H. Kato. J. Cellulose Inst. Tokyo 12:76-78 (1936).—The ignition points of four samples were 203° to 222° C.—A.P.-C.

Plastic Boards. W. A. Richardson. Brit. pat. 434,778.—In the manufacture of paper to be used in making plaster boards or gypsum laths, anhydrous, hydrated, or partly hydrated calcium sulphate is included in sufficient quantity, *e.g.* 1 to 10%, to insure that when such paper is applied to a mixture of plaster of Paris and water, there is no retardation of the crystal bond between the paper and the plaster. The calcium sulphate is preferably added in the beater.—A. P.—C.

Adhesives

Glueing. Papier-Ztg. 61, No. 39,776; No. 40,792-793 (May 13, 16, 1936) (in German); No. 42,820, 822 (May 23, 1936) (in English).—A discussion of the difficulties encountered in pasting paper to paper or to board and directions for overcoming the most common of these troubles. Humidity plays an important part; the dryer the paper or the greater the difference in moisture between the two fibrous felts to be united by the adhesive, the greater the tensions after application, and warping and curling will result. Starch paste has a much higher water content than animal glue and will therefore cause a greater swelling of the fibers; the thicker the application of the adhesive coat, the greater the contraction and warping on the coated side on drying. In order to secure good bonding strength, penetration of the paste into the body of the material is necessary; however, a too porous cardboard will absorb a thin paste entirely without leaving any upon the surface, while very hard boards or a highly sized paper will prevent or retard penetration. The kind and consistency of the glue must therefore be adapted to the surfaces treated, and eventually be corrected by the addition of some hygroscopic substance, such as glycerin, etc. Attention should also be paid to such factors as temperature and moisture of the air, machine and cross direction of the fibrous felts, the sizing of the paper, especially when sized and non-sized surfaces have to be united, the rate of drying, etc.—C.J.W.

Adhesives. Zellstoff U. Papier, 16, No. 5: 183-84, (May, 1936).—Classification of the various adhesives used in the paper industry and their individual uses.—J.F.O.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING DECEMBER 26, 1936

CIGARETTE PAPER

R. J. Reynolds Tobacco Co., *Pr. Harding,* Havre, 138 cs.; Standard Products Corp., *Manhattan,* Havre, 24 cs.; Standard Products Corp., *Champlain,* Havre, 46 cs.; Champagne Paper Corp., *Champlain,* Havre, 1,069 cs.; De Mauduit Paper Corp., *Champlain,* Havre, 2 cs.; H. H. Strauss, *Champlain,* Havre, 431 cs.; E. A. Kimpton, *Ausonia,* London, 1 cs.; De Mauduit Paper Corp., *Normandie,* Havre, 1 cs.; Champagne Paper Corp., *Normandie,* Havre, 750 cs.

WALL PAPER

F. J. Emmerich, *Deutschland,* Hamburg, 17 bls., 2 cs.; Globe Shipping Co., *Pr. Harding,* Hamburg, 4 rolls; ———, *Hansa,* Hamburg, 2 cs.; ———, *Europa,* Bremen, 50 cs.; ———, *Manhattan,* Havre, 4 cs.

NEWSPRINT

Perkins Goodwin & Co., *Hansa,* Hamburg, 339 rolls; Jay Madden Corp., *Hansa,* Bremen, 448 rolls; Jay Madden Corp., *Argosy,* Kotka, 35 rolls; International Paper Sales Co., *Cornerbrook,* Dalhousie, 97 rolls; International Paper Co., *Cornerbrook,* Dalhousie, 6,843 rolls; National Pulp & Paper Co. Inc., *Sandhamn,* Sundsvall, 439 rolls; ———, *Topdslafjord,* Skien, 414 rolls; Jay Madden Corp., *Manhattan,* Hamburg, 137 rolls; Perkins Goodwin & Co., *Deutschland,* Hamburg, 569 rolls.

PRINTING PAPER

Senefelder Co., *Hansa,* Hamburg, 25 cs.; R. Wilson Paper Corp., *Transylvania,* Glasgow, 30 rolls; Oxford University Press, *Samaria,* Liverpool, 7 cs.; Keller Dorian Paper Co., *Manhattan,* Havre, 1 ble.; Japan Paper Co., *Manhattan,* Havre, 5 cs.; M. M. Cohen, *Manhattan,* Hamburg, 10 bls.; Jay Madden Corp., *Manhattan,* Hamburg, 213 rolls; ———, *Ausonia,* London, 3 cs.

WRAPPING PAPER

Burroughs Wellcome Co. Inc., *American Banker,* London, 10 cs.; Heemsoth Kerner Corp., *Hansa,* Bremen, 11 bls.; M. M. Cohen, *Pr. Harding,* Hamburg, 33 bls.; Equitable Paper Bag Co. Inc., *Pr. Harding,* Hamburg, 144 bls.; Jay Madden Corp., *Pr. Harding,* Hamburg, 269 bls.; ———, *Deutschland,* Hamburg, 7 cs.

DRAWING PAPER

Keuffel & Esser Co., *American Banker,* London, 1 cs.; George Haas, *American Banker,* London, 2 cs.; H. Reeve Angel & Co. Inc., *American Banker,* London, 2 cs.; H. Reeve Angel & Co. Inc., *Ausonia,* London, 4 cs.

BRISTOL BOARDS

Keuffel & Esser Co., *American Banker,* London, 1 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., *American Banker,* London, 13 cs.; H. Reeve Angel & Co. Inc., *Aquitania,* Southampton, 34 pkgs.; H. Reeve Angel & Co. Inc., *Ausonia,* London, 3 cs.; C. Schleicher & Schull Co. Inc., *Hansa,* Hamburg, 2 cs.; C. Schleicher & Schull Co. Inc., *Deutschland,* Hamburg, 3 cs.

METAL PAPER

K. Pauli Co., *Hansa,* Hamburg, 5 cs.

SURFACE COATED PAPER

Hensel Bruckman & Lorbacher, *Hansa,* Bremen, 8 cs.

BARYTA COATED PAPER

Globe Shipping Co., *Europa,* Bremen, 15 crates, 12 cs.

PHOTO PAPER

J. J. Gavin, *Aquitania,* Southampton, 11 cs.

CREPE PAPER

———, *Hansa,* Hamburg, 7 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *American Traveler,* Liverpool, 33 cs.; B. F. Drakenfeld & Co., *Samaria,* Liverpool, 23 cs. (duplex).

DECALCOMANIAS

L. A. Consmiller, *Hansa,* Hamburg, 4 cs.; A. M. Schmid Co., *Hansa,* Hamburg, 2 cs.; Sellers Transportation Co., *Hansa,* Hamburg, 33 cs.; Sellers Transportation Co., *Europa,* Bremen, 23 cs.

TISSUE PAPER

Atlantic F'd'g. Co., *Hansa,* Hamburg, 16 cs.; W. J. Byrnes, *Pr. Harding,* Havre, 1 cs.

COLORED PAPER

Favor Ruhl & Co., *Champlain,* Havre, 5 cs.

DESIGN PAPER

Wilkes-Barre Lace Manufacturing Co., *Ausonia,* London, 1 cs.

WRITING PAPER

Japan Paper Co., *Ausonia,* London, 1 cs.

PAPER TUBES

———, *Hansa,* Hamburg, 108 pkgs.; ———, *Deutschland,* Hamburg, 132 pkgs.

MISCELLANEOUS PAPER

Keuffel & Esser Co., *Hansa,* Hamburg, 16 cs.; ———, *Topdalsfjord,* Oslo, 95 bls., 429 rolls; Jay Madden Corp., *Deutschland,* Hamburg, 316 rolls; A. Giese & Son, *Normandie,* Havre, 25 bls.

RAGS, BAGGINGS, ETC.

———, *American Traveler,* Manchester, 279 bls. bagging; Chase National Bank, *American Traveler,* Manchester, 75 bls. bagging; S. Frankenhuis & Son, *American Traveler,* Manchester, 53 bls. cotton waste; ———, *American Traveler,* Manchester, 125 bls. cotton waste, 29 bls. rags; Manufacturers Trust Co., *American Traveler,* Manchester, 29 bls. paper stock; Katzenstein & Keene, Inc., *American Traveler,* Manchester, 19 bls. paper stock;

———, *American Traveler,* Manchester, 52 bls. old strings; E. Butterworth & Co. Inc., *American Traveler,* Manchester, 61 bls. old strings; Chase National Bank, *American Banker,* London, 28 bls. rags; Manufacturers Trust Co., *American Banker,* London, 14 bls. rags; ———, *American Banker,* London, 36 bls. paper stock; Atlas Waste Manufacturing Co., *American Banker,* London, 14 bls. rags; Banco Coml. Italiane Trust Co., *Hansa,* Hamburg, 63 bls. rags; Banco Coml. Italiane Trust Co., *Argosy,* Gdynia, 51 bls. rags; S. Shapiro & Son, Inc., *Argosy,* Gdynia, 29 bls. rags; ———, *Konigstein,* Antwerp, 397 bls. bagging; Continental Bank Trust Co., *Konigstein,* Antwerp, 476 bls. flax waste; American Felt Co., *Konigstein,* Antwerp, 10 bls. jute waste; Manufacturers Trust Co., *Konigstein,* Antwerp, 30 bls. rags; Chase National Bank, *Konigstein,* Antwerp, 204 bls. bagging; Irving Trust Co., *Konigstein,* Antwerp, 162 bls. bagging; ———, *Konigstein,* Antwerp, 142 bls. rags; ———, *Transylvania,* Glasgow, 26 bls. rags, 59 bls. paper stock; Irving Trust Co., *Transylvania,* Glasgow, 57 bls. paper stock; Smith Paper Co., *Pr. Harding,* Hamburg, 42 bls. rags; J. Cohen & Son Co., *Samaria,* Liverpool, 20 bls. paper stock; ———, *Samaria,* Liverpool, 99 bls. rags; Banco Coml. Italiane Trust Co., *Pilsudski,* Gdynia, 227 bls. rags; ———, *Deutschland,* Hamburg, 101 bls. cotton waste; Banco Coml. Italiane Trust Co., *Deutschland,* Hamburg, 63 bls. rags.

GLUE STOCK, ETC.

American Express Co., *Samaria,* Liverpool, 348 bags hide cuttings; ———, *Saturnia,* Trieste, 250 bags hide glue; ———, *Saturnia,* Trieste, 500 bags bone glue.

OLD ROPE

Banco Coml. Italiane Trust Co., *Ausonia,* London, 102 coils; Banco Coml. Italiane Trust Co., *Pr. Harding,* Hamburg, 104 coils; ———, *Pr. Harding,* Hamburg, 41 coils.

CASEIN

———, *Hansa,* Hamburg, 134 bags; National City Bank, *Champlain,* Havre, 338 bags; ———, *Deutschland,* Hamburg, 134 bags.

WOOD PULP

Gottesman & Co. Inc., *Argosy,* Stockholm, 450 bls. sulphite, 76 tons; J. Andersen & Co., *Argosy,* Stockholm, 600 bls. sulphite, 101 tons; Lagerloef Trading Co., *Argosy,* Helsingfors, 629 bls. sulphite, 115 tons; Lagerloef Trading Co., *Argosy,* Helsingfors, 390 bls. mechanical pulp, 78 tons; Lagerloef Trading Co., *Argosy,* Wiborg, 2,253 bls. sulphite, 442 tons; Lagerloef Trading Co., *Argosy,* Wiborg, 312 bls. sulphate, 52 tons; Lagerloef Trading Co., *Argosy,* Kotka, 1,152 bls. sulphite, 195 tons; Lagerloef Trading Co., *Argosy,* Kotka, 1,520 bls. sulphate, 252 tons; Johaneson Wales & Sparre, Inc., *Argosy,* Gdynia, 1,500 bls. wood pulp, 150 tons; St. George Pulp & Paper Co. Ltd., *Princess Pat,* St. George, N. B., 8,642 bls. ground wood pulp; Guaranty Trust Co., *Pr. Harding,* Hamburg, 600 bls. wood pulp, 92 tons; Perkins Goodwin & Co., *Pr. Harding,* Hamburg, 653 bls. wood pulp, 102 tons; ———, *Pr. Harding,* Hamburg, 628 bls. wood pulp; ———, *Sandhamn,* Stugsund, 1,000 bls. sulphite, 200 tons; ———, *Sandhamn,* Stugsund, 750 bls. sulphate, 150 tons; Brown Bros. Harriman & Co., *Sandhamn,* Stugsund, 500 bls. sulphate, 100 tons; Johaneson Wales & Sparre, Inc., *Sandhamn,* Sundsvall, 2,020 bls. sulphite, 400 tons; Mead Sales Co. Inc., *Sandhamn,* Sundsvall, 210 bls. chemical pulp, 42 tons; Mead Sales Co. Inc., *Sandhamn,* Sundsvall, 210 bls. sulphite, 42 tons; Atterbury Bros., Inc., *Sandhamn,* Sundsvall, 450 bls. dry pulp, 75 tons; Bulkley Dunton & Co., *Sandhamn,* ———, 125 bls. sulphite, 25 tons; ———, *Sandhamn,* Hernosand, 3,625 bls. sulphate, 603 tons; ———, *Sandhamn,* Hernosand, 6,150 bls. sulphite, 1,006 tons; The Borregaard Co. Inc., *Topdalsfjord,* Sarpsborg, 1,118 bls. sulphate; ———, *Topdalsfjord,* Oslo, 1,319 bls. mechanical pulp; J. Andersen & Co., *Topdalsfjord,* Oslo, 1,835 bls. sulphite; Guaranty Trust Co., *Topdalsfjord,* Drammen, 1,875 bls. sulphite; Castle & Overton, Inc., *Deutschland,* Hamburg, 625 bls. wood pulp, 125 tons; Bank of N. Y. Trust Co., *Deutschland,* Hamburg, 485 bls. wood pulp, 97 tons.

WOOD PULP BOARDS

Absorbo Beer Pad Co., Inc., *Pr. Harding,* Hamburg, 300 bls.; ———, *Deutschland,* Hamburg, 990 bls.

WOOD PULP PASTE BOARDS

Phoenix Shipping Co., *Deutschland,* Hamburg, 55 bls.

ALBANY IMPORTS

WEEK ENDING DECEMBER 26, 1936

Bulkley Dunton & Co., *Schwanheim,* ———, 1,875 bls. wood pulp; Bulkley Dunton & Co., *Besholt,* ———, 2,000 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING DECEMBER 26, 1936

Pagel Horton & Co. Inc., *Nordvard,* Sweden, 5,539 bls. sulphite; Pagel Horton & Co. Inc., *Nordvard,* Sweden, 3,529 bls. sulphate.

NEW LONDON IMPORTS

WEEK ENDING DECEMBER 26, 1936

Bulkley Dunton & Co., *Besholt,* ———, 3,500 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING DECEMBER 26, 1936

———, *American Traveler,* Manchester, 140 bls. rags; Brown Bros. Harriman & Co., *American Traveler,* Manchester, 63 coils old rope; Brown Bros. Harriman & Co., *American Traveler,* Manchester, 12 bls. rags; E. Butterworth & Co. Inc., *American Traveler,* Manchester, 474 bls. paper stock; ———, *American Traveler,* Manchester, 406 bls. cotton waste; Leigh Textile Co., *American Traveler,* Manchester, 317 bls. cotton waste; S. Frankenhuis & Son, *American Traveler,* Manchester, 127 bls. cotton waste; ———, *American Traveler,* Liverpool, 77 bls. rags; Bulkley Dunton & Co., *Sandhamn,* ———, 3,900 bls. wood pulp; ———, *Sandhamn,* Stugsund, 1,125 bls. sulphite, 225 tons; Perkins Goodwin & Co., *Sandhamn,* Sundsvall, 980 bls. sulphite, 196 tons; Perkins Goodwin & Co., *Sandhamn,* Sundsvall, 2,700 bls. sulphate, 450 tons; Johaneson Wales & Sparre, Inc., *Sandhamn,* Sundsvall, 975 bls. sulphite, 185 tons; Johaneson Wales & Sparre, Inc., *Sandhamn,* Sundsvall, 180 bls. sulphate, 30 tons; ———, *Sandhamn,* Hernosand, 5,550 bls. sulphite, 925 tons; ———, *Sandhamn,* Hernosand, 1,580 bls. sulphate, 230 tons; Gottesman & Co. Inc., *Tungsha,* Norway, 2,400 bls. wood pulp; Pagel Horton & Co. Inc., *Fernbank,* Sweden, 375 bls. sulphate; Pagel Horton & Co. Inc., *Fernbank,* Sweden, 1,080 bls. sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 26, 1936

Neidich Process Co., *Argosy,* Helsingfors, 73 bls. paper; Lagerloef Trading Co., *Argosy,* Helsingfors, 390 bls. mechanical pulp, 78 tons; Castle & Overton, Inc., *Argosy,* Wiborg, 2,001 bls. wood pulp, 400 tons; Gottesman & Co. Inc., *Argosy,* Kotka, 500 bls. dry pulp, 101 tons; Lagerloef Trading Co., *Argosy,* Kotka, 1,300 bls. sulphite, 214 tons; Lagerloef Trading Co., *Argosy,* Kotka,

(Continued on page 45)

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, December 30, 1936.

Trading in the local paper market continues fairly active, the holiday lull being less pronounced than usual at this season. The outlook for the paper industry in the coming year is bright. Heavy consumption of the various grades is looked for and, due to rising operating costs, higher prices are anticipated.

The position of the newsprint paper market continues to improve. Manufacturing operations in the United States, Canada and Newfoundland are proceeding at near capacity to take care of the increased consumption. With the beginning of the new year the higher quotations recently announced will become effective.

Conditions in the fine paper market are fairly satisfactory. Demand for book, cover, bond and ledger papers is well sustained. Prices are steady to firm. Tissues are going forward at a good pace for the season. The coarse paper market is displaying strength, with indications of an upward price trend.

Mechanical Pulp

The ground wood pulp market is stronger. Production at home and abroad is being maintained in good volume to meet current requirements. Prices are firmer. Imported No. 1, moist and dry, are now quoted at from $29 to $31, on dock, Atlantic ports; while No. 1 domestic and Canadian are selling at from $30 to $31 delivered.

Chemical Pulp

Business in the chemical pulp market continues brisk. Due to scarcity of offerings, practically all domestic and foreign grades remain firm. Imported bleached kraft pulp is higher and is now quoted at from $3.25 to $3.75, on dock, Atlantic ports. Other grades of chemical pulp are steady.

Old Rope and Bagging

The old rope market is exhibiting a fairly strong undertone. Demand for domestic and imported old manila rope is holding up well. Old rope quotations are steady. The bagging market is strong. Scrap and gunny bagging are moving in good volume for the season. Roofing bagging is seasonally active.

Rags

Steadiness prevails in the domestic rag market. Paper mill demand for new and old cotton rags is fairly satisfactory. No. 1 white shirt cuttings continue to attract attention from home and foreign consumers and are now quoted at from $8 to $8.25, f.o.b. New York. No radical changes have transpired in the imported rag market.

Waste Paper

The paper stock market is fairly buoyant. As usual at this time of the year, manufacturers of paper and board are replenishing their stocks of raw materials, with the result that prices stiffen. Regarding the outlook for the forthcoming year sentiment is generally optimistic.

Twine

Despite the Christmas holiday lull the local twine market is still showing some liveliness. In most quarters every confidence is expressed of continued activity in the forthcoming year. Quotations on both hard and soft fiber twines continue firm as the year draws to a close.

IMPORTS OF PAPER AND PAPER STOCK

(*Continued from page 44*)

1,820 bls. mechanical pulp, 364 tons; ———, *Sandhamn,* Stugsund, 500 bls. sulphate, 100 tons; ———, *Sandhamn,* Stugsund, 250 bls. sulphite, 50 tons; Johaneson Wales & Sparre, Inc., *Sandhamn,* Sundsvall, 575 bls. sulphite, 105 tons; Mead Sales Co. Inc., *Sandhamn,* Sundsvall, 2,400 bls. sulphite, 400 tons; Perkins Goodwin & Co., *Sandhamn,* Sundsvall, 581 rolls newsprint; ———, *Sandhamn,* Sundsvall, 68 bls. newsprint; ———, *Sandhamn,* Hernosand, 180 bls. sulphite, 30 tons.

CAMDEN IMPORTS

WEEK ENDING DECEMBER 26, 1936

Brown Bros. Harriman & Co., *Sandhamn,* Hernosand, 3,000 bls. sulphate, 500 tons.

WILMINGTON IMPORTS

WEEK ENDING DECEMBER 26, 1936

Lagerloef Trading Co., *Argosy,* Wiborg, 2,825 bls. sulphite, 565 tons.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 26, 1936

Bulkley Dunton & Co., *Milos,* ———, 1,225 bls. wood pulp; Bulkley Dunton & Co., *Svaneholm,* ———, 1,200 bls. wood pulp; Bulkley Dunton & Co., *Tancred,* ———, 3,000 bls. wood pulp; Pagel Horton & Co. Inc., *Tancred,* Sweden, 1,848 bls. sulphate; Pagel Horton & Co. Inc., *Tancred,* Sweden, 7,350 bls. sulphite; Gottesman & Co. Inc., *Tancred,* Sweden, 400 bls. wood pulp; Gottesman & Co. Inc., *Svaneholm,* Sweden, 3,600 bls. wood pulp; Gottesman & Co. Inc., *Johannes Thordens,* Finland, 250 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING DECEMBER 26, 1936

———, *Tampa,* Bombay, 79 bls. rags.

NEWPORT NEWS IMPORTS

WEEK ENDING DECEMBER 26, 1936

Bulkley Dunton & Co., *Kelkheim,* ———, 1,250 bls. wood pulp.

NEW ORLEANS IMPORTS

WEEK ENDING DECEMBER 26, 1936

Gottesman & Co. Inc., *Ragnhildsholm,* Sweden, 900 bls. wood pulp.

GALVESTON IMPORTS

WEEK ENDING DECEMBER 26, 1936

Gottesman & Co. Inc., *Tennessee,* Sweden, 450 bls. wood pulp.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 30, 1936.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Conditions in the bleaching powder market are fairly satisfactory. The contract movement is normal for the season. Prices are generally steady and unchanged. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues firm. Domestic standard ground is now quoted at 19½ and finely ground at 20 cents; while French and Argentine standard ground are selling at 19½ and finely ground at 20 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Trading in the caustic soda market is moderately active. Contract shipments are moving freely. Solid caustic soda is quoted at from $2.55 to $2.60; while the flake and ground are selling at from $2.95 to $3 per 100 pounds, in drums, at works.

CHINA CLAY.—The china clay market is displaying strength. Paper mill demand is persistent. Prices are steady. Imported china clay is quoted at from $13 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE.—Steadiness prevails in the chlorine market. Demand from the paper mills is well sustained. Contract shipments are moving in good volume. Prices are steady. Chlorine is quoted at from $2.15 to $2.25 per 100 pounds, in car lots, at works.

ROSIN.—The rosin market continues strong. Paper making gum rosin is now quoted at $9.80 and wood rosin at $10.05 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $4.12 per 280 pounds, in tank cars, at works.

SALT CAKE.—Paper mill demand for salt cake is brisk. The contract movement is seasonal. Salt cake is quoted at from $12 to $13; chrome salt cake at from $11 to $12 per ton, at works; while imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting a fairly strong undertone. Shipments against contract are moving regularly. Quotations on soda ash, in car lots, at works, are still as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH.—Business in the starch market is fairly active. The contract movement is normal for the season. Prices remain unchanged. Special paper making starch is quoted at $4 per 100 pounds, in bags; and at $4.27 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is showing signs of improvement. Prices are holding to schedule. Commercial grades are quoted at from $1.35 to $1.60; while iron free is selling at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Yearly contracts are quoted at $18 per long ton, on orders of 1,000 tons, or over, and $20 on smaller quantities. On spot and nearby car loads, the quotation is $2 per ton. All quotations are in car lots, at works.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Prices are unchanged. Domestic talc is quoted at from $16 to $18 per ton, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
100% Rag Ext. No. 1	.36		.37
100% Rag	.29	@	.30
75% Rag	.22	@	.23
65% Rag	.19	@	.20
50% Rag	.15½	@	.16½
25% Rag	.13	@	.14

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
No. 1 Sulphite	7.50	@	8.50
No. 2 Sulphite	6.50	@	7.50
No. 3 Sulphite	6.00		7.00
No. 4 Sulphite	5.50		6.50
Book, B Grade, Cased			
S. & S. C.	6.10	@	6.85
S. & S. C. Litho.	6.35	@	7.10
M. F.	5.95	@	6.60
Coated and Enamel	7.15	@	8.00
Coated Litho.	7.15	@	8.00
Tissues—Per Ream—			
White No. 1	.82½	@	—
White No. 1 M. G.	.77½	@	—
White No. 1½	.62½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.67½	@	—
Colored	.80	@	—
Kraft	.67½	@	—
Manila	.60	@	—
Unbleached Toilet	2.60	@	3.30
Bleached Toilet	3.94	@	5.26
Paper Towels—			
Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—			
Roll, contract	41.00	@	—
Sheets	46.00	@	—
Kraft—			
No. 1 Northern	4.25	@	4.75
Standard	4.12½	@	4.25
Southern	4.00	@	—
Glazed	4.50	@	—
Striped	4.75	@	—
Boards, per ton—			
News	37.50	@	40.00
Chip	35.00	@	37.50
Sgl. Mla. Ll. Chip	50.00	@	52.50
Jute Lined Chip	50.00	@	52.50
Kraft Liners	65.00	@	67.50
White Pat. Coated	60.00	@	62.50
Binders Boards	70.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	29.00	@	31.00
Dry	29.00	@	31.00
(Delivered)			
No. 1 Domestic and Canadian	30.00	@	31.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.70	@	3.50
Prime Qualities—			
Class 1 All Prime Easy Bleaching	2.40	@	2.75
Other Than Easy Bleaching—			
Class 2 Higher than Standard	2.40	@	2.70
Class 3 Standard	2.35	@	2.50
Class 4 Lower than Standard	2.30	@	2.35
(On Dock, Atlantic Ports)			
Kraft Bleached	3.25	@	3.75
Kraft Light & Strong	2.30	@	2.60
Kraft No. 1	2.15	@	2.60
Kraft No. 2	2.10	@	2.25
(F.o.b. Pulp Mill)			
Kraft Domestic	1.95	@	2.30
(Delivered)			
Soda Bleached	2.70	@	—

Add 60 cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	8.00	@	8.25
Silesias No. 1	6.25	@	6.50
New Unbleached	8.25	@	8.50
New Soft Blacks	3.75	@	4.00
Blue Overall	6.75	@	7.00
Fancy	3.00	@	3.25
Washables	2.25	@	2.50
Mixed Khaki Cuttings	3.50	@	3.75
O. D. Khaki Cuttings	4.25	@	4.50

Old Rags

White, No. 1—			
Repacked	3.25	@	3.50
Miscellaneous	2.75	@	3.00
White, No. 2—			
Repacked	2.25	@	2.50
Miscellaneous	1.75	@	2.00
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.90	@	2.00
Roofing Rags—			
No. 1	Nominal		
No. 2	1.65	@	1.70
No. 3 (bagging)	1.50	@	1.55
No. 4	1.50	@	1.60
No. 5A	1.40	@	1.50

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.50
New Mixed Cuttings	2.00	@	2.25
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxfords	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.50	@	4.00
German Blue Linens	2.50	@	2.75
German Blue Cottons	2.00	@	2.25
Checks and Blues	2.00	@	2.25
Linsey Garments	2.15	@	2.25
Dark Cottons	1.90	@	2.10
Old Shopperies	1.75	@	2.00
New Shopperies	1.75	@	2.00
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.20	@	2.30
Domestic	2.15	@	2.25
Wool Tares, light	1.50	@	1.75
Wool Tares, heavy	1.85	@	2.05
Bright Bagging	1.70	@	1.75
Manila Rope—			
Foreign	2.75	@	3.00
Domestic	3.00	@	3.25
Jute Strings	2.75	@	3.00
Sisal Strings	2.60	@	2.75
Mixed Strings	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.65	@	2.75
Ordinary Hard White No. 1	2.25	@	2.35
Hard White No. 2	2.10	@	2.20
Soft White No. 1	2.00	@	2.10
Flat Stock—			
Stitchless	.90	@	.95
Over issue Mag	.90	@	.95
Solid Flat Book	.80	@	.85
Crumpled No. 1	.50	@	.55
Ledger Stock	.95	@	1.00
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.75	@	1.85
New Cuttings	1.35	@	1.45
Old Kraft Machine—			
Compressed bales	1.20	@	1.30
News—			
No. 1 White News	1.25	@	1.35
Strictly Overissue	.60	@	.70
Strictly Folded	.50	@	.55
No. 1 Mixed Paper	.45	@	.50

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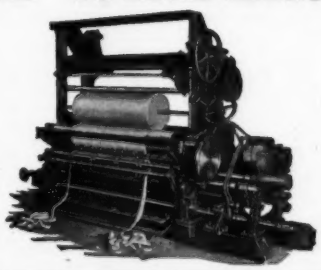

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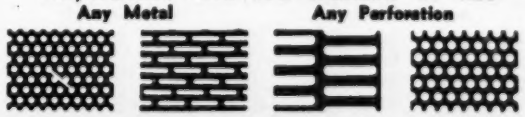

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Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—

India	.14¾	@	.17¼
Belg. White Hemp	.15¾	@	.19¼
India Compress	.15¾	@	.15¾

Fine Polished—

Fine India	.21	@	.23

Unpolished—

Box	.10¾	@	.11¼
Paper Makers	.10½	@	.12¾
Tube Rope	.11½	@	.14
Wall Paper	.12½	@	.13¼
Wrapping	.16	@	.20
Soft Fiber Rope	.13¾	@	.14¼

(Hard Fibre)

Bond	.13½	@	.22
Anchor	.13	@	.14½
Manila	.21	@	.28

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¾
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06½
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—

Container Lined—

85 Test, per 1000 sq. ft.	1.70		
100 Test, per 1000 sq. ft.	1.85		

Old Papers

(F. o. b. Chicago)

Shavings—

No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.60	@	.70
Solid Books	.50	@	.60
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45

Old Newspapers—

No. 1 Folded News	.42½	@	.45
No. 1 Mixed Paper	.25	@	.30

Roofing Stocks—

No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, M. F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.15	@	—
Coated Lithograph	6.15	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.08	@	.08½
New White, No. 2.	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft.	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.07	@	.07½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.02	@	.02½
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	2.00	@	2.25
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¼
New Canvas	.04	@	.04½
New Black Mixed.	.02	@	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	1.50	@	1.60
Domestic No. 2	1.40	@	1.50
Roofing bagging	1.10	@	1.20

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	2.75	@	—
Sisal Rope	2.25	@	2.35
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.25	@	2.50
No. 2	1.00	@	1.10
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.40
No. 2 Hard White	2.10	@	2.20
No. 1 Soft White	1.90	@	2.00
No. 2 Soft White	1.40	@	1.45
No. 1 Mixed	—	@	.85
Solid Ledger Stock	1.50	@	1.60
Ledger Stock, white	1.15	@	1.20
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy	.70	@	.75
Manila Cuttings	1.80	@	1.90
Print Manila	.55	@	.60
Container Manila	.55	@	.60
Kraft Paper	1.10	@	1.20
No. 1 Mixed Paper	.45	@	.50
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.60	@	.65
Overissue News	.70	@	.75
Old Newspapers	.50	@	.55

BOSTON

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.50	8.50
No. 2 Sulphite	6.50	7.50
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¼	@	—
No. 2 Kraft	.04½	@	—

(Delivered New England points)

Southern Kraft	.04	@	—
News Print Rolls	39.50	@	—
Straw Board, rolls	.009	@	35.00
Filled News Board	42.50	@	45.00
Chip Board	40.00	@	42.50
Single Manila Lined Chip	50.00	@	55.00
Single White, Patent Coated News Board (Bender)	60.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	70.00	@	—

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.20	@	2.35
No. 1 Soft White	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.80	@	.90
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.50	@	1.60
Manila Env. Cuttings, extra quality	1.75	@	1.85
No. 1 Old Manila	.60	@	.65
White Blank News	1.10	@	1.15
No. 1 Kraft	1.35	@	—
Mixed Papers	.42½	@	.47½
Print Manila	.60	@	.70
Container Manilas	.27½	@	—
Old Newspapers	.50	@	.55
Overissue News	.50	@	.65
Box Board Chips	.40	@	.45
Corrugated Boxes	.50	@	.60
Kraft corrugated boxes	.95	@	1.00
Screening Wrappers	.55	@	.60

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	3.00	@	—
Domestic	2.87½	@	—
Transmission Rope	1.25	@	1.35
Jute Rope	2.12½	@	2.25
Jute Carpet Threads	1.75	@	2.00
Gunny No. 1—			
Foreign	2.20	@	2.25
Domestic	2.00	@	2.05
Bleachery Burlap	4.25	@	4.50
Scrap Burlap—			
Foreign	2.10	@	2.15
Domestic	2.00	@	2.05
Scrap Sisal	2.10	@	2.15
Scrap Sisal for Shredding	2.25	@	2.35
Wool Tares, heavy	2.00	@	2.10
New Burlap Cuttings	2.25	@	2.50
Australian Wool Pouches	2.75	@	3.00
Heavy Baling Bagging	2.25	@	2.65
Paper Mill Bagging	1.75	@	1.80
Bagging No. 2	1.30	@	1.35

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.03½	@	.03¾
New White No. 1.	.07¾	@	.08¼
New White No. 2.	.05	@	.05½
Silesias No. 1	.06¾	@	.07
New Black Silesias	.04	@	.04¼
Soft Unbleached	.08½	@	.08¾
Blue Chevoit	.07	@	.07¼
Fancy	.03¼	@	.03½
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue Overalls	.06¾	@	.07
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04½
O. D. Khaki	.04½	@	.04¾
Corduroy	.03	@	.03¼
New Canvas	—	@	.05
B.V.D. Cuttings	.08	@	.08¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.75	@	1.80
No. 2	1.65	@	1.70
No. 3	1.30	@	1.35

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.95	@	2.10
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	2.05	@	2.25
Old Linsey Garments	2.25	@	2.50
New Silesias	5.75	@	6.00

TORONTO

Paper

Bond—Delivered—

No. 5 White	.10¾	@	—
No. 6 White	.10	@	—
No. 5 Tints	.11¾	@	—
No. 6 Tints	.10½	@	—
No. 5 Golden Rod	.12¾	@	—
No. 6 Golden Rod	.12	@	—

Ledgers—

Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½

Book—

No. 1 M. F.	6.50	@	6.75
No. 2 M. F.	6.25	@	6.50
No. 3 M. F.	5.00	@	5.35
No. 1 S. C.	7.00	@	7.50
No. 2 S. C.	6.50	@	7.00
No. 3 S. C.	5.50	@	6.00
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—

Wrapping—delivered—

Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	4.80	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	Nominal		
Sheets	Nominal		

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	.90
Light and Crumpled Book Stock	.70	@	.80
Ledgers and Writings	.90	@	1.00
Manilas—			
New Manila Cut	1.20	@	1.40
Printed Manilas	.55	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.55	@	.60
Strictly Folded	.50	@	.55
No. 1 Mixed Paper	.40	@	.45

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.07	@	.08½
Fancy Shirt Cuttings	.03	@	.03½

JAN 4 1937

PAPER TRADE JOURNAL

Vol. CIII DECEMBER 31, 1936 No. 27

Greetings!

The tolling of New Year's Bells will usher in the 173rd birthday of the Geigy organization and the 78th anniversary of its participation in the manufacture of synthetic dyestuffs.

It was almost immediately after the discovery of Mauve by Perkins that Geigy entered the dyestuff field, contributing some of the outstanding dyestuffs used in all industries and majorly in textiles.

This old, but modern, organization takes this opportunity to extend to you its heartiest greetings for a very prosperous and Happy New Year with an assurance of its sincerest cooperation and earnest servicing of your business.

May good fortune and good business be yours during 1937.

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Boston Providence Cincinnati Philadelphia Charlotte Toronto Portland, Ore.

Eventually—

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To it has been added junk remover, rag catcher, settling trough, and screens....these mechanisms to remove all floating and heavy trash, both large and small.

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The Shartle breaker system has replaced one or more of every other make ever placed on the market....and no other breaker layout has ever permanently replaced a Shartle.

Again, "Why not now?"

SHARTLE

Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial offices: 15 W. 47th St., New York, N. Y. Domestic subscription U. S. and possessions, $4.00 per year.

Suctionize

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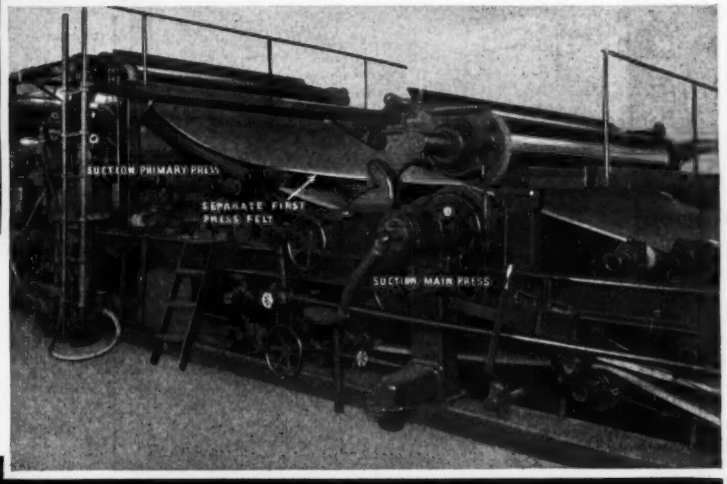
PRIMARY PRESS
MAIN PRESS



Note the short top felt for suction drum press nip. All plain primaries have been removed.

Wet pickup felt returns after suction primary press. Suction first press is on separate felt.

1. Removes large quantity water without disturbing formation or finish.
2. Reduces crushing and checking.
3. Improves finish. Reduces felt marks.
4. Permits use of light weight short top felt. Lower felt cost.
5. Eliminates several nips. Improves test of board.
6. Permits more bulk if desired.
7. Increases test or permits cheaper furnish and maintain same test.
8. Suction main press more efficient on separate felt.

* Suction drum press is equivalent to suction drum and suction primary press.

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MODEL 28

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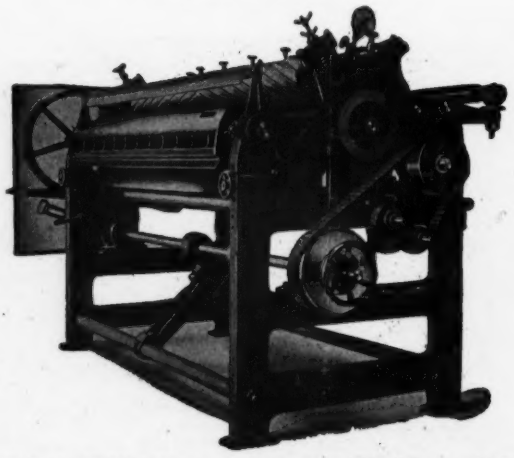

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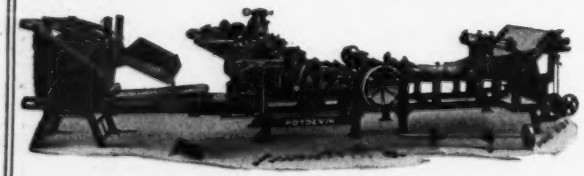

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★ We also extend to you our wishes for a very Happy and Prosperous New Year.

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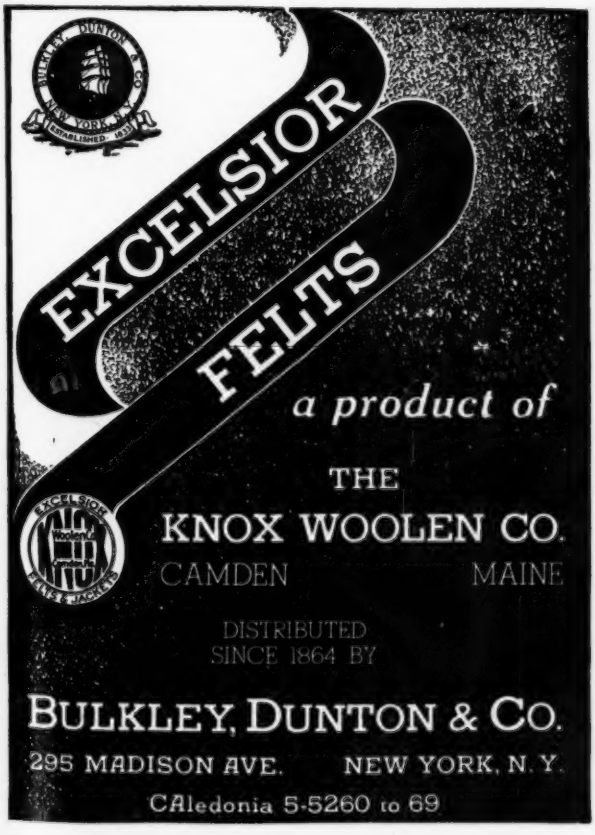

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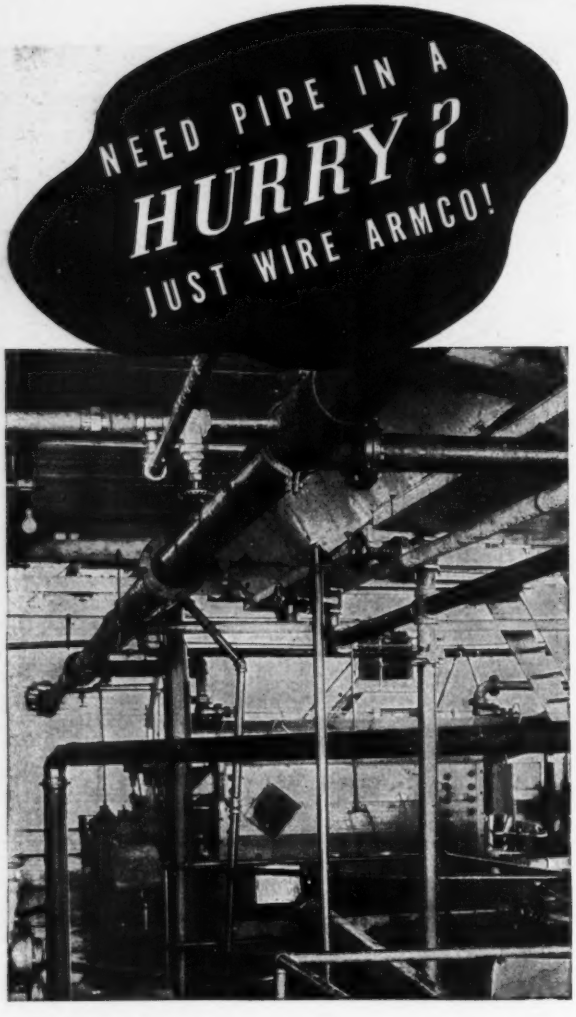

A few lengths or a hundred—it makes no difference. Just wire or mail your specifications to Armco, and you'll get Armco Spiral Welded Pipe when and *how* you want it. The *how* is just as important as the when; and you'll see what we mean when Armco Spiral Welded Pipe is set down on your receiving platform . . . pipe that is trim, strong, and free from surplus weight . . . pipe that is straight as a gun barrel, amazingly true round, and smooth inside for high-flow capacity. And with this time-saving, money-saving pipe, you can get any type of special fitting and connection you need. Also long lengths and the right coating for the job. What are your present needs? The American Rolling Mill Company, *Pipe Sales Division* • Middletown, Ohio

ARMCO

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SPIRAL WELDED PIPE

LOCKWOOD'S DIRECTORY

OF THE PAPER AND ALLIED TRADES

1936 EDITION

CORRECTED UP-TO-DATE

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Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.

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Classified List of Pulp Mill Products
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Twine Manufacturers
Vegetable Parchment Manufacturers
Wall Paper Printers
Water Marks and Brands
Waxed Paper Manufacturers

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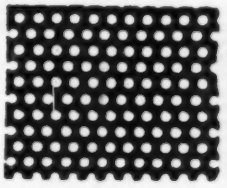

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Experience during the past twelve years with the use of the Marcy Open End Rod Mill for the mixing and beating of paper stock indicates conclusively the merits of this machine and this principle. It merits your investigation.

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WANTED—Finishing Room Foreman who has had several years' experience in Finishing Room of modern mill producing book and bond grades. Applicant must be sober, alert, capable of handling labor and a worker for quality production. State age, salary expected to start, experience and education. Replies treated confidentially. Address Box 36-621, care Paper Trade Journal. D-31

WANTED by Southern envelope manufacturer, a Superintendent thoroughly familiar with F. L. Smithe wide range and plunger type machines as well as the operation of Harris Blanker. Give references and full information as to experience. Good proposition for right man. Address Box 36-618, care Paper Trade Journal. D-31

MACHINE TENDER—Experienced in the operation of a Yankee Fourdrinier to produce strong tissues and wrapping papers of high gloss. Only thoroughly experienced men need apply. List references and detail experience in your letter. Position on West Coast. Address Box 36-635, care Paper Trade Journal. tf

WANTED—Master Mechanic, also Coating Foreman. Charles P. Raymond Service, Paper Mill Dept., 294 Washington St., Boston. D-31

PAPER SALESMEN WANTED—For Paper & Twine House located in New York City. Will also consider men for New Jersey, Long Island, Conn. and N. Y. State Territory. Address Box 36-659, care Paper Trade Journal. D-31

SALES MANAGER WANTED — Experienced Paper man to direct and build up Sales Force for a wide awake N. Y. City Jobber. State full particulars. Replies confidential. Address Box 36-660, care Paper Trade Journal. D-31

WANTED—Machine Tender for paper mill in Los Angeles, California. Address Box 36-657, care Paper Trade Journal. J-21

BACK TENDER for Pacific Coast Paper Mill. Replies confidential. Our employees have been notified of this advertisement. Address Box 36-658, care Paper Trade Journal. J-21

WANTED—Assistant Master Mechanic for large Book Mill. Must be experienced in making paper mill repairs. Technical training desirable but not essential. State age, experience, education and references. Address Box 36-655, care Paper Trade Journal. J-7

WANTED—Materials Engineer for a large Book Mill. Technical training and practical experience necessary. State age, experience, education and references. Address Box 36-656, care Paper Trade Journal. J-7

WANTED—FOREMAN for small coating department or color room of an Eastern Paper Mill. One familiar with multi-colored coated papers preferred. Write in confidence giving full particulars of experience, age, salary, etc. Address Box 36-654, care Paper Trade Journal. D-31

WANTED—CHEMIST with extensive knowledge of book and coating manufacturing and printing. Address Box 36-653, care Paper Trade Journal. J-21

SITUATIONS WANTED

POSITION WANTED as assistant manager or plant engineer. Technical graduate of M. I. T. with nearly ten years' experience in the paper business. Capable. Employed at present. Address Box 36-661, care Paper Trade Journal. D-31

ADJUSTER—15 years' experience, seeks position. Can handle flat and square paper bags, specialties, Potdevin, Lockport, Matador, Holweg Bag Machines, perforated, simplex rotary. No. 1 machine. Address Box 36-626, care Paper Trade Journal. J-28

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MASTER MECHANIC—20 years' experience. College and technical education. Thoroughly familiar with paper mill problems. Possesses modern ideas to increase production and lower maintenance costs. Capable of supervising new construction work and paper mill revamping. Excellent references. Address Box 36-599, care Paper Trade Journal. D-31

SALES ENGINEER Pulp and paper mill machinery and equipment, excellent contact with superintendents and mill executives, open for representing manufacturer of equipment. Many years' sales experience. Salary or commission. Address Box 36-603, care Paper Trade Journal. tf

SALESMAN—Branch Sales manager with technical and practical papermaking experience, will consider change with real remunerative possibilities and guarantee productive representation. Address Box 36-612, care Paper Trade Journal. D-31

WAXED PAPER OPERATOR—Experienced on Waxing Machines, sheet cutter, rewinder flat bed cutter, capable of taking full charge of finishing room. Can give best of references. Address Box 36-644, care Paper Trade Journal. J-14

SUPERINTENDENT of Binder Board Mill would like to make a change. 12 years' experience as Super. Address Box 36-643, care Paper Trade Journal. J-7

ASSISTANT MANAGER or General Superintendent, open for position. Board training. Technical graduate. Address Box 36-641, care Paper Trade Journal. J-7

SURFACE-COATED PAPER CHEMIST with years of experience in friction, flint, plate, metallic, mica and waterproof papers, seeks connection with Eastern Mill. Employed. References. Address Box 36-640, care Paper Trade Journal. J-14

MISCELLANEOUS

CLARK MANUFACTURING COMPANY. Holyoke, Mass. Telephone 2-4370. Builders of cylinder moulds, couch and felt rolls, dandy rolls. We cover dandies and cylinders tight for fast running machines. tf

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ARE YOU interested in—1st: Lower sizeing costs? 2nd: Uniform sizeing costs? Address all communications to Box 36-629, care Paper Trade Journal. F-18

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WANTED

WANTED—Cameron Slitter, preferably Type 6 Model. State size, price and condition. Address Box 36-605, care Paper Trade Journal. tf

WANTED—Used Gurley Densometer. Mention style, condition and price. Address Box 36-647, care Paper Trade Journal. D-31

WANTED—Used Tension Machine in good operating condition. Address Box 36-662, care Paper Trade Journal. D-31

WANTED—Used Towel Interfolder. State make, age, width and condition, where can be seen, lowest cash price. Address Box 36-652, care Paper Trade Journal. D-31

FOR SALE

PAPER COATING MACHINERY—Waxing, Oiling, Gumming, Gluing, Asphalt Duplexing Laboratory Coating and Treating machines. High speed. New improvement. MAYER COATING MACHINES COMPANY, INC., Rochester, N. Y. T.F.

FOR SALE

Fourdrinier Paper Machine, wire 112" x 60', two presses, 22 dryers 48 x 110", two calenders, reel and winder.
Fourdrinier Paper Machine, trims 110", two presses, 30 dryers 48 x 116", 9 roll calender, reel and winder.
Harper Fourdrinier Machine, trims 72". Two presses, 19 dryers 36 x 76", two calenders, reel, winder, drive.
Fourdrinier Paper Machine, wire 114" x 65', two presses, 28 dryers 48 x 115", one calender, drive.
New Cylinder Paper Machine, molds 36 x 91", four baby presses, one primary press. Three main presses. 32 dryers 48 x 88". Two calenders. Duplex cutter.

FRANK H. DAVIS COMPANY
175 Richdale Ave. Cambridge, Mass.

FOR SALE—Paper Mill suitable for the manufacture of high grade rag papers and condenser tissues. 84" Fourdrinier Paper Machine, beaters, washers, rag equipment, finishing equipment. Brick buildings sprinkled. Water and steam power. Attractive price. Address Box 36-627, care Paper Trade Journal. D-31

FOR SALE—Harper Fourdrinier. Two presses, 19 dryers 36 x 76", two calenders, reel, winder and drive. Fourdrinier. Suction couch. Two presses. 24 dryers 36" x 84". Two calenders. Reel. Slitter and winder. Address Box 36-650, care Paper Trade Journal. J-7

CATERPILLAR CRANES—New, but not latest model, Orton 10-ton capacity gas crane, 40' boom, guaranteed, 25% reduction to $5875, f. o. b. Ind. factory. Also, completely rebuilt used Model 206 P & H gas caterpillar crane, 40' boom, splendid condition; $3250, Milwaukee. Both revolving, can handle 1-yd. coal or grapple buckets. H. Y. Smith Co., Milwaukee, Wisconsin. D-31

FOR SALE—One 66" Combination Paper Making Machine complete, having 20 Dryers, 2 Calender Stacks, Reel and Warren Winder. Machine recently closed down. Now in excellent condition, ready to run, and priced right for quick sales. Address Box 36-648, care Paper Trade Journal. D-31

FOR SALE—Two 30" Paper Rolling Machines, one 30" Barrel or Roll Elevator 12'-6" lift belt drive, one Williams Moisture Tester with scales for paper on sulphite, one Koegel Slitter Knife Grinder, three Cylinder Moulds 36" diameter x 74" face, one cylinder mould 40" diameter x 96" face, one Reeves No. 3 type G, variable speed transmission. Address Box 36-649, care Paper Trade Journal. D-31

FOR SALE—36" Sheridan, new model Cutter in first class working order and condition. Address Box 36-664, care Paper Trade Journal. D-31

FOR SALE—Tissue Mill, running 7 days a week, entire production sold. Address Box 36-663, care Paper Trade Journal. J-7

FOR SALE—92" Wide Langston Slitter for sale. Reasonable price. Address Box 36-606, care Paper Trade Journal. D-31

SHARTLE OFFERS:

MACHINE STACKS

1—62″ 5-roll machine stack
1—64″ 5-roll machine stack
1—64″ 9-roll machine stack
1—70″ 6-roll machine stack
1—72″ 7-roll machine stack
1—72″ 5-roll machine stack
1—80″ 7-roll machine stack
2—82″ 7-roll machine stacks
1—84″ 9-roll machine stack
1—84″ 4-roll machine stack
1—84″ 5-roll machine stack
1—86″ 9-roll machine stack
1—100″ 4-roll machine stack
1—100″ 5-roll machine stack
1—108″ 7-roll machine stack
1—114″ 10-roll machine stack
1—156″ 9-roll machine stack

DRYERS

40—new dryers 24 x 60
40—new dryers 48 x 60
28—dryers 36 x 48
30—new dryers 60 x 136
27—new dryers 60 x 164
22—dryers 60 x 204

MACHINES

1—120″ Fourdrinier machine
1—104″ Fourdrinier machine
1— 90″ Fourdrinier machine
1—156″ Fourdrinier machine
1—142″ Fourdrinier machine

1—68″ 3-cylinder machine
1—108″ single cylinder tissue machine
1—3-cylinder 48″ machine
1—5-cylinder 104″ board machine

1—96″ Rogers wet machine
1—72″ single press Rogers wet machine, three primaries
1—84″ wet machine
3—74″ wet machines
4—84″ wet machines

GENERATORS AND ENGINES

1—1000 KW Turbo-generator
1—750 KW Turbo-generator
1—240 KW belt-driven generator

1—10 x 12 Brownell variable speed engine
1—12 x 14 Brownell variable speed engine
1—11 x 12 Chandler Taylor variable speed engine
1—Heavy Duty 24 x 48 Hamilton Corliss engine, 500 H. P.
2—14 x 16 Brownell variable speed engines
2—14 x 14 x 16 Erie Ball variable speed engine

PUMPS

2—#4 Nash vacuum pumps
2—#0 Nash vacuum pumps

1—almost new Gould centrifugal pump, 3,500 G.P.M.
1—almost new Gould centrifugal pump, 10 x 8
1—Frederick Centrifugal pump, 1,500 G.P.M.—80' head
1—Frederick Centrifugal pump, 1,200 G.P.M.—150' head
1—DeLaval Centrifugal pump, 5,500 G.P.M.—50' head

2—engine driven condenser pumps, Wheeler Mfg. Co., size 6″
2—8 x 10 B & C duplex stuff pumps
1—8 x 10 Gould triplex water pump
1—Quimby screw pump, 300 G.P.M., 150' head
1—Quimby screw pump, 750 G.P.M., 131' head

CUTTERS

1—78″ cutter for wet machine
1—72″ Hamblet duplex cutter
1—110″ Hamblet duplex cutter
2—Taylor Stiles rag cutters

JORDANS

6—Jones Imperial jordans
1—Jones Majestic jordan
1—Miami #6 jordan
3—Noble & Wood Mammoth jordans

SCREENS

1—6-plate Bird tailing screen
12—Impco pulp screens
4—18-plate screens
2—Leithwalk screens
1—Voith screen

ROLLS

1—14-9/16 x 92 suction press
1—18 x 136″ suction couch
1—18 x 138″ Farnham roll
1—30 x 178″ suction couch roll

CALENDERS

6—sheet calenders
2—binder board calenders
2—48″ super calenders
2—54″ super calenders
1—62″ super calender
2—72″ super calenders
2—62″ 9-roll calenders

MISCELLANEOUS

1—Hayton circulating agitator
1—Hayton combination agitator and centrifugal pump
1—72″ x 72″ breaker beater . . Shartle
1—Noble & Wood iron tub beater
1—Hesse Iron Works baler, 20 x 18 bale
1—Ohio baler, 18 x 16 bale
1—Pope brusher
1—pair of Farrell roll calipers, to caliper 24″ diameter
4—84″ Carthage chippers
1—Mitts & Merrill pulp wood chipper
2—Lombard chip crushers
1—Ingersoll Rand steam driven air compressor, 7 x 6
1—New digester 16 x 42
2—Wing dusters
80—pair new anti-friction bearings suitable for dryers
1—first-effect of Zaremba evaporator
2—second-effects of Zaremba evaporator
1—4-effect Scott evaporator
7—Erkensators
1—Black-Clawson shake
1—Sturtevant fan, size 40
2—#5 Sturtevant exhaust fans with vertical motor
1—Tool grinder—2 wheels
1—Grindstone
1—36″ x 12' Powell planer
2—8″ pipe machines
1—Bolt threader
6—Air hoists
1—Lidgerwood hoist
1—Elevator hoist
12—beater hydrants
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1—Bauer attrition mill
2—Allen mixers
2—14' Globe rotaries
1—Williams Shredder
1—Jeffrey Hammermill shredder
1—paper stock shredder
1—12″ quick opening dump valve (beater)
1—96″ Oliver
1—New Haven lathe, 32″ over carriage, 12'-10″ between centers Lathes, planers, drill presses, hacksaws, pipe machines, bolt threaders, wood working equipment.
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Greene, Tweed & Co.

BELTING (Conveyer, Transmission and V)
The Cincinnati Rubber Mfg. Co.
L. H. Gilmer Co.
Goodrich Rubber Co., B. F.
Goodyear Tire & Rubber Co.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Rhoads Sons, J. E.

BLACK LIQUOR STRENGTH RECORDER (Operates Signals)
Leeds & Northrup Company

BLEACHING APPARATUS
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Shartle Brothers Machine Co.,

BLEACHING POWDER
American Cyanamid & Chemical Corp.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.
Pennsylvania Salt Mfg. Co.

BLOCKS (Toe)
The Richardson Co.

BLEACHING PROCESS
Electro Bleaching Gas Co.
Pennsylvania Salt Mfg. Co.

BLOW PIPES
Moore & White Co.
Murray Mfg. Co., D. J.

BLOW PITS
Kalamazoo Tank & Silo Co.
Murray, D. I. Mfg. Co.
Valley Iron Wks.
G. Woolford Wood Tank Mfg. Co.

BLOWERS (Centrifugal)
Chicago Electric Co.
De Laval Steam Turbine Co.
Roots - Connersville Blower Corp.
Ross Engineering Corp., J. O.

BOILER PRESERVATIVES
Magnus Chemical Co.

BOTTOMS (Steel & Wood)
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Mundt & Sons, Charles

BRASS AND COPPER PRODUCTS (Rod, Wire, Sheet, Tube and Plates, Pipe, Water Tube)
Chase Brass & Copper Co.

BRIDGES (Electrical)
Leeds & Northrup Company

BUCKETS (Elevating)
Hendrick Mfg. Co.
Link-Belt Co.

BUSHINGS
Improved Paper Mchry Co.
Manhattan Rubber Mfg. Co., Division of Raybestos-Manhattan, Inc.
Walworth Co.
Woods, T. B. Sons Co.

CADMIUM REDS
Chemical & Pigment Co.

CADMIUM YELLOWS
Chemical & Pigment Co.

CALENDERS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Moore & White Co.
Norwood Engrg. Co.
Perkins & Son, Inc., B. F.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co
The Textile Finishing Machy. Co.
Valley Iron Works
Waldron Corp., John

CALENDER ROLLS
Appleton Machine Co.
Beloit Iron Wks.
Black-Clawson Company
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Norwood Engineering Co.
Perkins & Son, Inc., B. F.
Shartle Brothers Machine Co.,
The Textile Finishing Machy. Co.
Waldron Corp., John

CALIPERS (Micrometer)
Farrel-Birmingham Co.
Lobdell Car Wheel Co.

CAMERAS (Photomicrographic)
Bausch & Lomb Optical Co.
R. Fuess, Inc.

CARBON TETRACHLORIDE
Diamond Alkali Company
Pennsylvania Salt Mfg. Co.

CASEIN
American Cyanamid & Chemical Corp.
Casein Co. of America
Paper Makers Chemical Corp.

CASTINGS (Alloy, Brass, Bronze, Iron)
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
The Frederick Iron & Steel Co.
Hamblet Machine Co.
International Nickel Co.
Jeffrey Mfg. Co.
Link Belt Co.
Lobdell Car Wheel Co.
Michigan Steel Casting Co.
Montague Machine Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.

CAUSTIC SODA
American Cyanamid & Chemical Corp.
Diamond Alkali Co.
Electro Bleaching Corp.
Johaneson, Wales & Sparre, Inc.

CEMENT (Acid Proof)
Pennsylvania Salt Mfg. Co.
Stebbins Engrg. & Mfg. Co.

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Shartle Brothers Machine Co.,
Singer, J. E.
Williams Apparatus Co.

CHAIN DRIVES
Link-Belt Co.
Morse Chain Company

CHEMICAL ENGINEERS
J. B. Calva & Co.

CHEMICAL FEED EQUIPMENT
Fibre Making Processes, Inc.
Leeds & Northrup Company
Wallace & Tiernan Co., Inc.

CHEMICALS
American Cyanamid & Chemical Corp.
Chemical & Pigment Co.
Diamond Alkali Company
E. I. du Pont de Nemours & Co., Inc.
Electro Bleaching Gas Co.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co., Inc.
Johaneson, Wales & Sparre, Inc.
N. Y. Color & Chemical Co.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
Williams & Co., C. K.

CHIP CUTTERS
Fibre Making Processes, Inc.

CHIP DUSTERS
Fibre Making Processes, Inc.

CHIPPERS
Allis Chalmers Mfg. Co.
Appleton Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

CHLORINATING APPARATUS
Stebbins Engrg. & Mfg. Co.

CHLORINE
Diamond Alkali Company
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.
Pennsylvania Salt Mfg. Co.

CHLORINE CONTROL APPARATUS
Wallace & Tiernan, Co., Inc.

CHROME PLATE
Chromium Corporation of America.

CHUCKS
Economy Chucks, Inc.
John Waldron Corp.

CLAY
American Cyanamid & Chemical Corp.
English China Clays Sales Corp.
International Pulp Co.
Paper Makers Importing Co.
Vanderbilt Co., R. T.

CLEANING MATERIALS
Bird Machine Co.
Magnus Chemical Co.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.

CLUTCHES
Allis Chalmers Mfg. Co.
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
Farrel-Birmingham Co.
Link-Belt Co.
Moore & White Co.
D. J. Murray Mfg. Co.
T. B. Wood's Sons

CO2 RECORDERS
Leeds & Northrup Company

COAL & ASH HANDLING MACHINERY
Link Belt Co.

COATING MACHINERY
Cameron Machine Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.,
Strachan & Henshaw, Ltd.
Waldron Corporation, John
Weber, Herman G.

COATING MATERIALS
Paper Makers Chemical Corp.
Stebbins Engrg. & Mfg. Co.

WHERE TO BUY

COCKS, Lubricated
Crane Co.
Walworth Co.
COGS
Bowsher, N. P., The
COLORIMETERS
Bausch & Lomb Optical Co.
Testing Machines, Inc.
COLOR ANALYZERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.
COLOR MIXING EQUIPMENT
Shartle Brothers Machine Co., Waldron, John, Corp.
COMBINING MACHINE
Shartle Brothers Machine Co., Waldron, John, Corp.
COMBUSTION CONTROL SYSTEMS
Leeds & Northrup Company
COMPRESSORS
Allis-Chalmers Mfg. Co.
Chicago Electric Co.
Delaval Steam Turbine Co.
Oliver United Filters, Inc.
Roots-Connersville Blower Corp.
Worthington Pump & Machinery Corporation
CONDENSERS
Worthington Pump & Machinery Corporation
CONDENSER TUBES
Chase Brass & Copper Co.
CONDUCTIVITY RECORDERS
Leeds & Northrup Company
CONSULTING & RESEARCH
J. B. Calva & Co.
CONTROLLING INSTRUMENTS
Bristol Co., The
The Brown Instrument Co.
R. Fuess, Inc.
General Electric Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Taylor Instrument Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
CONVEYOR BELTS
The Cincinnati Rubber Mfg. Co.
Link Belt Co.
CONVEYORS (Broke)
Black-Clawson Company
CONVEYOR CHAINS
Link-Belt Co.
CONVEYORS
Link-Belt Co.
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.
COOKING APPARATUS
E. D. Jones & Sons Co.
COOKING AND RECOVERY PROCESS
Chemipulp Process, Inc.
Fibre Making Processes, Inc.
Murray Mfg. Co., D. J.
Ross Engineering Corp., J. O.
COOLERS
Fibre Making Processes, Inc.
Ross, J. O. Mfg. Co.
Stebbins Engrg. & Mfg. Co.
COPPER WATER TUBE AND SWEAT FITTINGS
Chase Brass & Copper Co.
CORES (Paper)
Elixman Paper Co.
CORES (Steel)
The McNeil Machine & Engrg. Co.
Smith & Winchester Mfg. Co.
COUCH ROLLS
American Wringer Co.
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
Downingtown Mfg. Co.
Goodrich Rubber Co., B. F.
Moore & White Co., The
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Shartle Brothers Machine Co.,
Montague Machine Co.
D. J. Murray Mfg. Co.
Stowe-Woodward, Inc.
Valley Iron Wks.
COUPLINGS
Allis Chalmers Mfg. Co.
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel Co.
Link Belt Co.
Moore & White Co.
Shartle Brothers Machine Co.,
Waldron Corp., John
Walworth Co.
T. B. Wood's Sons
CREPING MACHINES
Beloit Iron Works
Hudson Sharp Machine Co.
Paper Converting Machine
Shartle Brothers Machine Co., Co., Inc.
John Waldron Corp.
CUTTERS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Seybold Machine Co.
Shartle Brothers Machine Co.,
CYLINDER MACHINES
Beloit Iron Wks.
Black-Clawson Company
Downingtown Mfg. Co.
Improved Paper Mchry. Co.
Moore & White Co.
Pusey & Jones Corp.
Shartle Brothers Machine Co.,
Valley Iron Wks.
CYLINDER WIRES
Appleton Wire Works
Castle & Overton
International Nickel Co.
International Wire Works
Lindsay Wire Weaving Co.
Purves Machine Wire Co., Inc.
Sinclair Co.
DAMPENERS
Perkins & Son, Inc., B. F.
DAMPER REGULATORS
The Brown Instrument Co.
Minneapolis-Honeywell Co.
DECKERS
Appleton Machine Co.
Bird Machine Company
Improved Paper Mchy. Corp.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Oliver United Filters, Inc.
Shartle Brothers Machine Co.,
Valley Iron Works
DECKLE STRAPS
Shartle Brothers Machine Co.,
Stowe-Woodward, Inc.
DEFOAMERS
National Oil Products Co.
DIE CUTTERS
Appleton Machine Co., The
DIES (Cutting and Creasing)
The Richardson Co.
DIESEL ENGINES
Worthington Pump & Machinery Corporation
DIFFUSER ROOM EQUIPMENT
Fibre Making Processes, Inc.
DIGESTERS
Pusey & Jones Corp.
Stebbins Engrg. & Mfg. Co.
DIGESTER FITTINGS
J. Murray Mfg. Co.
DIGESTER LININGS
Stebbins Engrg. & Mfg. Co.
DOCTORS
Beloit Iron Wks.
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Carwheel Co.
Shartle Brothers Machine Co.,
Valley Iron Wks.
DOCTOR BLADES
The Cincinnati Rubber Mfg. Co.
Goodrich Rubber Co., B. F.
Improved Paper Mchy. Corp.
International Nickel Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Richardson Co.
Stowe-Woodward, Inc.
DOCTOR BLADES (Bronze For)
Chase Brass & Copper Co.
Black-Clawson Company
Shartle Machine Co.
DRAINAGE SYSTEMS
Crane Company
Stickle Steam Specialties Co.
DRIERS
Allis Chalmers Mfg. Co.
Beloit Iron Wks.
Black-Clawson Company
Link Belt Co.
Ross, J. O. Engineering Corp.
Shartle Brothers Machine Co.
Waldron, John, Corp.
DRIVE STANDS
Beloit Iron Works
Black-Clawson Company
Moore & White Co.
Shartle Brothers Machine Co.,
DRIVES
Beloit Iron Works
Bird Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Co.
Link-Belt Co.
Moore & White Co.
Murray, D. J.
Pusey Jones Corp.
Shartle Brothers Machine Co.,
Valley Iron Wks.
DRYING SYSTEMS
Murray Mfg. Co., D. J.
Ross Engineering Corp., J. O.
Stickle Steam Specialties
Waldron Corporation, The
DUAL PRESS (Horizontal)
Beloit Iron Works
DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Norwood Eng. Co.
D. J. Murray Mfg. Co.
DYESTUFFS & COLORS
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
Heller & Merz
National Aniline & Chemical Co.
N. Y. Color & Chemical Co.
Paper Makers Chemical Co.
C. K. Williams & Co.
ELECTRIC EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Co.
EMBOSSING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co.
John Waldron Corp.
EMBOSSING ROLLS
The Appleton Machine Co.
Hudson Sharp Machine Co.
B. F. Perkins & Son, Inc.
Roehlen Engraving Works, Inc.
The Textile Finishing Machy. Co.
Waldron Corporation, John
EVAPORATORS
Swenson Evaporator Co.
Traylor Engrg. & Mfg. Co.
EXTRACTORS
Bird Machine Company
Downingtown Manufacturing Co.
Valley Iron Works Co.
FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.
FAN CONTROLS (Ventilating)
The Brown Instrument Co.
Minneapolis-Honeywell Co.
FEEDERS
Traylor Engrg. & Mfg. Co.
FEED WATER HEATERS
Worthington Pump & Machinery Corporation
FELT CARRIER ROLLS
American Wringer Co.
Appleton Machine Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
Downingtown Mfg. Co.
Goodrich Rubber Co., B. F
Shartle Brothers Machine Co.,
Stowe-Woodward, Inc.
Valley Iron Wks.
FELT CLEANERS
Magnus Chemical Co.
FELT CONDITIONERS
Bird Machine Company
FELT CONDITIONER PLATE
The Richardson Co.
FELTS
Appleton Woolen Mills
Bulkley, Dunton & Co.
Draper Bros. Co.
Huyck & Son, E. C.
Knox Woolen Co.
Lockport Felt Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Turner, Halsey Co.
Waterbury Felt Co.
FELT GUIDES
Gilbert & Nash Co.
Moore & White Co.
Shartle Brothers Machine Co.,
John Waldron Corp.
Shartle Brothers Machine Co.,
FELT TIGHTENER (Automatic)
John Waldron Corp.
FELT WHIPPER BARS
The Richardson Co.
FILTERS
Improved Paper Mchy. Corp.
Moore & White Co.
Norwood Engrg. Co.
Oliver United Filters Inc.
J. O. Ross Engrg. Corp.
Stebbins Engrg. & Mfg. Co.
Swenson Evaporator Co.
FILTER CLEANERS
Magnus Chemical Co.
FILTER WIRES
Chase Brass & Copper Co.
International Nickel Co.
FITTINGS, Pipe (Plain end or flanged)
Crane Co.
Michigan Steel Castings Co.
Walworth Company
FLANGED FITTINGS
Chase Brass & Copper Co.
Crane Company
Walworth Company
FLEXIBLE COUPLINGS
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
The Frederick Iron & Steel Co.
Link-Belt Co.
Shartle Brothers Machine Co.,
John Waldron Corp.
T. B. Wood's Sons
FLEXIBLE SLICE
E. D. Jones & Sons Co.
FLOORING
Goodrich, B. F. Rubber Co.
Hendrick Mfg. Co.
Norton Co.
Stebbins Engrg. & Mfg. Co.
FLOW METERS
Bristol Co., The
The Brown Instrument Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
FLY BARS
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Jones & Sons Co., E. D.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.,
FOAM ELIMINATION
J. B. Calva & Co.
FOLDING ENDURANCE TESTERS
Testing Machines, Inc.
FOLDING MACHINES
Hamblet Machine Co.
Hudson Sharp Machine Co.
Norwood Eng. Co.
Paper Converting Machine Co., Inc.
Waldron, John, Corp.
FORMING MACHINES
Downingtown Mfg. Co.
Shartle Brothers Machine Co.,
FOURDRINIER MACHINES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Moore & White Co.
Pusey & Jones
Shartle Brothers Machine Co.,
Smith & Winchester
FOURDRINIER WIRES
Appleton Wire Works
Castle & Overton
International Wire Works
Lindsay Wire Weaving Co.
Purves Machine Wire Co.
Sinclair Co.
FREENESS RECORDERS
Trimbey Machine Works
FREENESS TESTERS
Testing Machines, Inc.
FREQUENCY RECORDERS
Leeds & Northrup Company
FURNACE PRESSURE (Draft) Control
Leeds & Northrup Company

WHERE TO BUY

GALVANIZED IRON SHEETS
The American Rolling Mill Company

GALVANIZED STEEL SHEETS
The American Rolling Mill Company

GALVANIZED COPPER-BEARING STEEL SHEETS
The American Rolling Mill Company

GALVANOMETERS
Leeds & Northrup Company

GAS ANALYSIS EQUIPMENT (SO_2 and CO_2 Recorders)
Leeds & Northrup Company

GAS BURNER CONTROLS (Automatic Systems)
The Brown Instrument Co.
Minneapolis-Honeywell Co.

GAS ENGINES
Worthington Pump & Machinery Corporation

GEARS
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Link-Belt Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Richardson Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.
John Waldron Corp.

GEAR BLANKS
The Richardson Co.

GENERATORS
Allis Chalmers Mfg. Co.
Chicago Electric Co.
De Laval Steam Turbine Co.
General Electric Co.

GRANITE ROLLS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Perkins & Son, Inc., B. F.

GRAPPLES
J-B Engineering Sales Co.

GRATING (Sidewalk)
Hendrick Mfg. Co.

GRINDING WHEELS
Norton Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Seybold Machine Co.

GUMMED TAPE TESTERS
Thwing-Albert Instrument Co.

HAMMERS (Soft Faced)
Greene, Tweed & Co.

HAND CLEANERS
Magnus Chemical Co.

HANGERS
Crane Co.
Link Belt Co.
Walworth Co.
T. B. Wood's Sons Co.

HEATERS
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
J. O. Ross Engrg. Corp.

HEATING AND VENTILATING SYSTEMS
Crane Co.
J. E. Singer
Ross Engineering Corp., J. O
Stickle Steam Specialties Co

HEAT-TREATING FURNACES
Leeds & Northrup Company

HIGH DENSITY THICKENERS
Shartle Brothers Machine Co.,

HOISTS
Allis Chalmers Mfg. Co.
Appleton Machine Co.
General Electric Co.
E. D. Jones & Sons Co.
Link Belt Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
Goodrich Rubber Co.
Goodyear Tire & Rubber Mfg. Co.
Manhattan Rubber Mfg. Co.

HOT ROLLED SHEETS
The American Rolling Mill Company

HUMIDITY RECORDERS
Leeds & Northrup Company

HYDRAULIC MACHINERY
Farrel-Birmingham Co.

INDICATORS
The Bristol Co.
The Brown Instrument Co.
General Electric Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Taylor Instrument Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

INTERFOLDING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.
John Waldron Corp.

INSTRUMENTS
Bowsher, N. P.
The Bristol Co.
The Brown Instrument Co.
R. Fuess, Inc.
General Electric Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co
Taylor Instrument Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co.

JORDANS
The Appleton Machine Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.
Valley Iron Works

JORDAN FILLINGS
Appleton Machine Co.
Bahr Bros. Mfg. Co., The
International Nickel Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.
Valley Iron Works

K MONEL
International Nickel Co.

KNIVES (Multi V. Drives)
Shartle Brothers Machine Co.,

KNIVES
Beloit Iron Wks.
Dilts Machine Works, Inc.
Hamblet Machine Co.
J. W. S. Trading Co., Inc.
Simonds Worden White
Taylor, Stiles & Co.
Valley Iron Wks.

LABELLING MACHINES
Potdevin Machine Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Dilts Machine Wks.
Leeds & Northrup Company
Noble & Wood Machine Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co
Valley Iron Works
Williams Apparatus Co

LATHES
Montague Machine Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.

LEVELERS
National Oil Products Co

LIGHTS
Portable Light Company

LIQUID LEVEL RECORDERS
Leeds & Northrup Company

LIME MUD FILTERS
Oliver United Filters, Inc.

LITHOPONE
Chemical & Pigment Co.
Krebs Pigment & Color Corp.
New Jersey Zinc Co.

LOAD (Electrical) Control
Leeds & Northrup Company

LOFT DRYERS
Ross Engineering Corp., J. O.
John Waldron Corp.
Valley Iron Wks.

LUBRICANTS
Gulf Refining Co.
Standard Oil Co. of Indiana
Tidewater Oil Co.

MAGNIFIERS (Pocket)
Bausch & Lomb Optical Co.
R. Fuess, Inc.

MARKING BANDS (Rubber)
Stowe-Woodward, Inc.

MEASURING INSTRUMENTS
Leeds & Northrup Company

METERS
The Bristol Co.
The Brown Instrument Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Roots Connersville Blower
Thwing Instrument Co.
Worthington Pump & Machinery Corporation

METERING & PROPORTIONING SYSTEMS
The Brown Instrument Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Trimbey Machine Works

MICROMETERS
Farrel-Birmingham Co.
Lobdell Carwheel Co.
Montague Machine Co.
Testing Machines, Inc.

MICRO-PROJECTORS
Bausch & Lomb Optical Co.

MICROSCOPES
Bausch & Lomb Optical Co.
R. Fuess, Inc.
Testing Machines, Inc.

MONEL METAL (Covered Rolls)
The International Nickel Co.

MONEL METAL (Rolled Forms)
The International Nickel Co.

MOTORS
Allis-Chalmers Mfg. Co.
Chicago Electric Co.
General Electric Co.

NAPKIN FOLDING MACHINE
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

NICKEL-CLAD STEEL
The International Nickel Co.

NICKEL IRON ALLOYS
The International Nickel Co.

NI-RESIST CAST IRON
The International Nickel Co.

OILLESS BEARINGS
The Richardson Co.

OLYMPIC BRONZE (Special)
Chase Brass & Copper Co.

OPACIFYING PIGMENT
Chemical & Pigment Co.
Krebs Pigment Co.
New Jersey Zinc Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.

PACKAGING MACHINES
Hudson Sharp Machine Co.

PACKING
Cincinnati Rubber Mfg. Co.
Goodrich, B. F. Rubber Co.
Goodyear Tire & Rubber Co.
Manhattan Rubber Co.
Rhoads, J. E. Sons
Stebbins Engrg. & Mfg. Co.

PACKING (Specially Treated to Caustic Soda and Alkalies)
Greene, Tweed & Co.

PACKAGING (Rubber)
B. F. Goodrich Rubber Co.
The Manhattan Rubber Mfg Division of Raybestos-Manhattan, Inc.

PAPER BAG MACHINERY
Potdevin Machine Co.
Smith & Winchester Mfg. Co.
Shartle Brothers Machine Co.,
Strachan & Henshaw, Ltd.
Weber, Herman G.

PAPER BREAK RECORDERS
Thwing-Albert Instrument Co.

PAPER CUTTERS
Black-Clawson Company
Downingtown Mfg. Co.
Hamblet Machine Company
Moore & White Co.
Seybold Machine Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.

PAPER MACHINE APRONS
Goodrich Rubber Co., B. F.

PAPER MACHINE DRIER CONTROL SYSTEMS
The Brown Instrument Co.
Minneapolis-Honeywell Co.

PAPER MANUFACTURERS
West Virginia Pulp & Paper Co.

PAPER MACHINE HOODS
Ross Engineering Corp., J. O.

PAPER MACHINE SLICES
Beloit Iron Works
Black-Clawson Company
Montague Machine Co.

PAPER ROLLS
B. F. Perkins & Son, Inc.
The Textile Finishing Machy. Co.
Waldron Corp., John

PAPER SCALES
Testing Machines, Inc.
Thwing-Albert Instrument Co

PAPER TESTERS
R. Fuess, Inc.
Perkins & Son, Inc., B. F.
Testing Machines, Inc.
Thwing-Albert Instrument Co
Valley Iron Works Co.
Williams Apparatus Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Langston Co., Samuel M.

PAPER WAXING MACHINERY
Potdevin Machine Co.
Shartle Brothers Machine Co.,
Waldron, Corp., John

PASTING MACHINES
Black-Clawson Company
Beloit Iron Works
Moore & White Co.
Murray, D. J., Mfg. Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.,
John Waldron Corp.
Weber, Herman G.

PENESCOPE PENETRATION TESTER
Thwing-Albert Instrument Co.

PERFORATING MACHINES
Dietz Machine Works
Waldron John, Corp.

PERFORATED METAL
Chase Brass & Copper Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

pH Control (Automatic)
Leeds & Northrup Company

pH CONTROL
Leeds & Northrup Company
Wallace & Tiernan, Co., Inc.

pH TESTERS
Leeds & Northrup Company
Wallace & Tiernan, Co., Inc.
Wilkens-Anderson Co.

PILLOW BLOCKS
Link Belt Company
T. B. Wood's Sons Co.

PIPE
Chase Brass & Copper Co.
The International Nickel Co.

PIPE (Spiral Welded)
The American Rolling Mill Co.

PIPE (Stainless)
Mundt & Sons, Charles

PIPE (Wood)
Wyckoff, A., & Son

PIPING
American Rolling Mill
Crane Co.
Goodrich, B. F. Rubber Co.
International Nickel Co.
Mundt & Sons, Charles
J. E. Singer
Walworth Co.

PLATES (Filter)
J. E. Singer
Stebbins Engrg. & Mfg. Co.

PLATES, IRON
The American Rolling Mill Company

PLATES, STEEL
The American Rolling Mill Company

PLATING, CHROMIUM
Chromium Corp. of America

PLATERS
Perkins & Son, Inc., B. F.

PLAYING CARD MACHINERY
Waldron, John, Corp.

PLUGS (Jordan)
Black-Clawson Company
Shartle Brothers Machine Co.

PLUGS
E. D. Jones & Sons Co.

POTENTIOMETERS
Leeds & Northrup Company

POWER TRANSMISSION EQUIPMENT
Allis Chalmers Mfg. Co.
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.
Moore & White Co.
Murray, D. J.
T. B. Wood's Sons

WHERE TO BUY

PRECISION INSTRUMENTS
The Bristol Co.
Brown Instrument Co.
R. Fuess, Inc.
Leeds & Northrup Company
Taylor Instrument Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Fibre Making Processes, Inc.
The McNeil Machine & Engrg. Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Valley Iron Wks.
Waldron Corp., John

PRESSES (Dual Suction)
Beloit Iron Works

PRESS ROLLS
American Wringer Co., Inc.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
Downingtown Mfg. Co.
Goodrich Rubber Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Pusey & Jones Corp
Stowe-Woodward, Inc.
Valley Iron Works Co.

PRESS ROLLS (Granite)
Beloit Iron Works
Perkins & Son, Inc., B. F.

PRESSURE BULKERS
B. F. Perkins & Sons, Inc.

PRINTING PRESSES
Harris Seybold Potter Co.
Hudson Sharp Machine Co.
Potdevin Machine Co.
Paper Converting Machine Co., Inc.
Strachan & Henshaw, Ltd.
John Waldron Corp.
Weber, Herman G.

PULLEYS
Beloit Iron Wks.
Black-Clawson Company
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
Link-Belt Co.
Montague Machine Co.
D. J. Murray Mfg. Co.
Shartle Brothers Machine Co.,
Valley Iron Wks.
T. B. Wood's Sons

PULPSTONES
Norton Co.

PULPS
Andersen Co., J.
Castle & Overton
Gottesman & Co., Inc.
Johaneson, Wales & Sparre, Inc.
Lagerloef Trading Co.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PULPERS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co
Shartle Brothers Machine Co.,

PULP MACHINERY
Bird Machine Company
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Stebbins Engrg. & Mfg. Co.

PULP SCREENS
Bird Machine Company
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Trimbey Machine Works

PULP THICKENERS
Bird Machine Company
Downingtown Mfg. Co.
D. J. Murray Mfg. Co.
Moore & White Co
Shartle Brothers Machine Co.,

PULP WASHERS
Oliver United Filters, Inc.

PULP WOOD MACHINERY
Montague Machine Co.

PULPWOOD STACKERS
Link Belt Co.

PUMP PRIMERS (Steam and Water Jet)
Valley Iron Works Co.

PUMP VALVE BALLS (Rubber)
Stowe-Woodward, Inc.

PUMPS
Allis-Chalmers Co.
Beloit Iron Works
Black-Clawson Company
Buffalo Pumps, Inc.
The Brown Instrument Co.
Chicago Electric Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
Frederick Iron and Steel Co
De Laval Steam Turbine Co.
Minneapolis-Honeywell Co.
Moore & White Co.
Morris Machine Works
Nash Engineering Co.
Oliver United Filters Inc.
Roots - Connersville Blower Corp.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.
Worthington Pump & Machinery Corporation
Valley Iron Works

PYROMETERS (Roll)
The Bristol Co.
The Brown Instrument Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

RAG CUTTERS
Perkins & Son, Inc., B. F.
Taylor Stiles & Co.

REAM COUNTERS
Hamblet Machine Co.

REBUILT MOTORS
Chicago Electric Co.
Shartle Brothers Machine Co.,

RECORDING INSTRUMENTS
The Bristol Co.
The Brown Instrument Co.
General Electric Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Taylor Instrument Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Trimbey Machine Wks.

RECOVERY SYSTEMS
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp., J. O.
Stebbins Eng. & Mfg. Co.
Swenson Evaporator Co.

REELS
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co
Hudson Sharp Machine Co.
Moore & White Co.
Shartle Brothers Machine Co.,

REFINERS
Appleton Machine Co.
Bahr Bros.
E. D. Jones & Sons Co.
Murray, D. J.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.,
Valley Iron Wks.

REFRACTORIES
Norton Co.

REGULATORS
The Bristol Co.
The Brown Instrument Co.
General Electric Co.
Leeds & Northrup Company
Link Belt Company
Mason Neilan Regulator Co
Minneapolis-Honeywell Co.
Taylor Instrument Co.
Trimbey Machine Works

REWINDERS
Black-Clawson Company

ROD MILLS
Allis-Chalmers Co.
Mine & Smelter Supply Co.
Murray, D. J. Mfg. Co.
Traylor Engrg. & Mfg. Co.

ROLLS (Brass and Copper)
Black-Clawson Company
Chase Brass & Copper Co.
Shartle Brothers Machine Co.,

ROLLS (Chilled Iron & Gray Iron)
Black-Clawson Company
Farrel-Birmingham Co.
Improved Paper Mchy. Corp.
Lobdell Car Wheel Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co.
Valley Iron Works

ROLLS (Rubber or Rubber Covered)
American Wringer Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.
B. F. Goodrich Rubber Co.
D. J. Murray Mfg. Co.
Downingtown Mfg Co.
Improved Paper Mchy. Corp.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Shartle Brothers Machine Co.,
Stowe-Woodward. Inc.

ROLL CHUCKS
Economy Chucks, Inc.

ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.

ROLL SLITTING MACHINES
Cameron Machine Co.
Langston Co., Samuel M.

ROLL STANDS
Cameron Machine Co.
Moore & White Co.
Shartle Brothers Machine Co.,

ROLL WINDING MACHINES
Cameron Machine Co
Potdevin Machine Co.

ROOFING
J. E. Singer

ROPE DRIVES
Allis-Chalmers Mfg. Co.

ROTARY BLEACHING BOILERS
The McNeil Machine & Engrg. Co.

ROTARY COOLERS
Traylor Engrg. & Mfg. Co.

ROTARY DRYERS
Traylor Engrg. & Mfg. Co.

ROTARY KILNS
Traylor Engrg. & Mfg. Co.

RUBBER COVERING
Cincinnati Rubber Mfg. Co.
Manhattan Rubber Mfg. Co.
The Richardson Co.
Stowe Woodward, Inc.

RUBBER MOLDS
The McNeil Mch. & Engrg. Co.

SALT
Pennsylvania Salt Mfg. Co.
Solvay Sales Co.

SALT CAKE
Gottesman Co.
Johaneson, Wales & Sparre, Inc.
Pennsylvania Salt Mfg. Co.

SATURATING MACHINES
Beloit Iron Wks.
Black-Clawson Company
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.,
Waldron, John, Corp.
Weber, Herman G.

SAVEALLS
Bird Machine Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
Moore & White Co.
Oliver United Filters, Inc.
The Richardson Co.
Shartle Brothers Machine Co.,

SCALES
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SCORE TESTERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SCREEN DIAPHRAGMS
The Cincinnati Rubber Mfg. Co.
Goodrich Rubber Co., B. F.
Manhattan Rubber Mfg. Co.

SCREENS
Appleton Wire Works
Beloit Iron Works
Bird Machine Company
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
International Wire Works
Improved Paper Mchy. Corp.
E. D. Jones & Sons Co.
Link-Belt Co.
Montague Machine Co.
Moore & White Co.
Charles Mundt & Sons
D. J. Murray Mfg. Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

SCREEN PLATE
Bird Machine Company
D. J. Murray Mfg. Co.
Hendrick Mfg. Co.
Improved Paper Mchy Corp
Shartle Brothers Machine Co

SCRUBBERS
Traylor Engrg. & Mfg. Co.

SHAFTS
E. D. Jones & Sons Co.

SHAFTS, COLLAPSIBLE WINDOWS
Moore & White Co.

SHAFTS (Forged)
T. B. Wood's Sons
Moore & White

SHAKE SPRINGS
The Richardson Co.

SHEET MACHINE
Noble & Wood Machine Co.
Williams Apparatus Co.

SHEET METAL WORK
J. E. Singer

SHEAVES
Montague Machine Co.
T. B. Wood's Sons Co.

SHELLS
E. D. Jones & Sons Co.

SHOWER PIPES
Bird Machine Company
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
Smith & Winchester Mfg. Co

SHREDDERS (Pulp and Paper)
Taylor Stiles & Co.

SILICATE OF SODA
American Cyanamid & Chemical Corp.
Philadelphia Quartz Co.

SIZING
American Cyanamid & Chemical Co.
Bennett, Inc.
Paper Makers Chemical Corp
National Oil Products

SIZING PROCESS
American Delthirna Corp.
Bennett, Inc.
J. B. Calva & Co.
National Oil Products Co
Ross Engrg. Corp., J. O.

SLIME ELIMINATION
Wallace & Tiernan, Co., Inc

SLIME REMOVER
Magnus Chemical Co.

SLITTERS AND REWINDERS
Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Hamblett Machine Co.
Langston Co., Samuel M.
Moore & White Co.
Smith & Winchester Mfg. Co.
Strachan & Henshaw, Ltd.
Waldron Corporation, John

SLUICE BOARDS
The Richardson Co.

SMOKE DENSITY INDICATING RECORDERS
Leeds & Northrup Company

SO_2 RECORDERS
Leeds & Northrup Company

SODA ASH
American Cyanamid & Chemical Corp.
Diamond Alkali Company
Johaneson, Wales & Sparre Inc.
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.

SOAP POWDER
Magnus Chemical Co.
Paper Makers Chemical Corp.

SODIUM METASILICATE
Philadelphia Quartz Co.

SODIUM SULPHATE
Johaneson, Wales & Sparre, Inc.
Pennsylvania Salt Mfg. Co.

WHERE TO BUY

SODIUM SULPHIDE
Johanesen, Wales & Sparre, Inc.

SORTING TABLES
Moore & White Co.

SPECIAL MACHINERY
Askania Regulator Co.
D. J. Murray Mfg. Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblet Machine Co.
Hudson Sharp Machine Co.
Montague Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.,
John Waldron Corp.

SPECIAL PIPE FITTINGS
The American Rolling Mill Company

SPECIALTY DEVELOPMENT
J. B. Calva & Co.

SPEED INDICATING RECORDERS
Leeds & Northrup Company

SPEED REDUCERS
Beloit Iron Works
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.
Moore & White Co.

SPIRAL WELDED PIPE
The American Rolling Mill Company

SPROCKETS
Improved Paper Mchy. Corp.
Link Belt Co.

STAINLESS STEEL SHEETS, STRIP, PLATES
The American Rolling Mill Company

STAIR and FLOOR TILES—(Non-Slip)
Norton Company

STAIR TREADS
Hendrick Mfg. Co.
Norton Company

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.

STEAM SPECIALTIES
Crane Co.
Stickle Steam Specialties Co.

STEEL (Electric Furnace Open Hearth)
Timken Roller Bearing Co.
Timken Roller Bearing Co.

STEEL PLATE CONSTRUCTION
Hendrick Mfg. Co.
Link-Belt Co.
Ross Engrg. Corp., J. O.

STOCK CUTTERS
Perkins & Son, Inc., B. F.

STOKERS—Screw or Plunger Type
The Frederick Iron & Steel Co.
Link Belt Co.
Swenson Evaporator Co.

STOCK REGULATORS
Trimbey Machine Co.

STRAW MAKING MACHINERY
Samuel H. Langston Co.

STUFF CHESTS
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
Jones & Sons Co., E. D.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co
Shartle Brothers Machine Co.,
Valley Iron Works Co.
G. Woolford Wood Tank Mfg. Co.

STUFF PUMPS
Beloit Iron Works
Buffalo Pumps, Inc.
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
The Frederick Iron & Steel Co
Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.,
Smith & Winchester Mfg. Co
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
Downingtown Mfg. Co.
Shartle Brothers Machine Co.,
Trimbey Machine Co.

SUCTION BOX COVERS
Beloit Iron Wks.
Black-Clawson Company
Gilbert & Nash
E. D. Jones & Sons Co.
Moore & White Co.
The Richardson Co.
Shartle Brothers Machine Co..

SUCTION ROLLS
American Wringer Co.
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.

SULPHUR
American Cyanamid & Chemical Corp.
Texas Gulf Sulphur Co.

SULPHUR BURNERS
Chemi. Pulp Process
Valley Iron Wks.

SUPER CALENDERS
Beloit Iron Works
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Moore & White Co.
Norwood Engrg. Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co.
The Textile Finishing Machy Co.
Goodrich Rubber Co., B. F.
Manhattan Rubber Mfg. Co.
Stowe-Woodward, Inc.

TABLE ROLLS
American Wringer Co.
Beloit Iron Works
Black-Clawson Company
The Cincinnati Rubber Mfg. Co.

TACHOMETERS
The Brown Instrument Co.
The Bristol Co.
Leeds & Northrup Company
Minneapolis-Honeywell Co.
Testing Machines, Inc.

TANKS
Hendrick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg
J. O. Ross Engrg. Corp.
Stebbins Engrg. & Mfg. Co.
Traylor Engrg. & Mfg Co
G. Woolford Wood Tank Mfg.

TEAR TESTERS
Testing Machines, Inc.
Thwing-Albert Instrument Co

TELEMETERS
Leeds & Northrup Co.

TELETYPE MACHINES
American Tel. & Tel. Co.

TEMPERATURE RECORDERS
The Bristol Co.
R. Fuess, Inc.
Leeds & Northrup Company
Taylor Instrument Co.
Testing Machines, Inc
Thwing-Albert Instrument Co

TENSILE TESTERS
Perkins & Son, Inc. B. F.
Testing Machines, Inc.
Thwing-Albert Instrument Co

TESTERS (Bursting Strength)
Testing Machines, Inc.
Perkins & Son, Inc., B. F

TESTERS (pH)
Leeds & Northrup Company
Thwing-Albert Instrument Co.
Wallace & Tiernan, Co., Inc
Wilkens Anderson Co.

TESTERS (Smoothness)
R. Fuess, Inc.
Williams Apparatus Co.

TESTERS (Stiffness)
R. Fuess, Inc.
Testing Instruments, Inc.
Thwing-Albert Instrument Co

TESTING INSTRUMENTS (Thickness Test)
Testing Instruments, Inc.

TESTING INSTRUMENTS (Basis Weights)
R. Fuess, Inc.
Testing Instruments, Inc.
Thwing-Albert Instrument Co.

TESTING LABORATORY
J. B. Calva & Co.
E. I. du Pont de Nemours & Co., Inc.

THICKENERS
Bird Machine Company
Dorr Co.
Downingtown Mfg. Co.
Improved Paper Mchy. Corp.
Moore & White
D. J. Murray Mfg. Co.
Oliver United Filters, Inc
Shartle Brothers Machine Co..

TITANIUM PIGMENT
Chemical & Pigment Co.
Krebs Pigment & Color Corp
Titanium Pigment Co.
R. T. Vanderbilt Co.

TIE RODS
International Nickel Co.

TOILET FOLDING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.

TOILET WINDERS
Cameron Machine Co.
Dietz Machine Works
Hudson Sharp Machine Co.

TOWEL FOLDING MACHINES
Paper Converting Machine Co., Inc.
Waldron Corp., John

TOWEL INTERFOLDING MACHINES
Dietz Machine Works
Hudson Sharp Machine Co.

TOWEL WINDER
Cameron Machine Co.
Hudson Sharp Machine Co.
Waldron Corp., John

TOWERS
Cameron Machine Co.
Hudson Sharp Machine Co.
Stebbins Engrg. & Mfg. Co.
Waldron Corp., John

TRANSMISSION MACHINERY
Beloit Iron Works
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.
Shartle Brothers Machine Co.,
Timken Roller-Bearing Co.
T. B. Wood's Sons

TRAPS (Steam)
Crane Co.

TRUCKS
Moore & White Co.

TUBES (Paper)
Elixman Paper Core Co.

TUBING
Chase Brass & Copper Co.
The International Nickel Co
The Richardson Co.
Timken Roller Bearing Co.

TUBS (Wood)
De Laval Steam Turbine Co
G. Woolford Wood Tank Mfg. Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Roots - Connersville Blower Corp.
S. Morgan Smith

TURBO-GENERATORS
Allis-Chalmers Mfg. Co.
Chicago Electric Co.
De Laval Steam Turbine Co.

USED EQUIPMENT
Chicago Electric Co.
Shartle Brothers Machine Co.,

VACUUM CONTROL
A. E. Broughton Co.

VALVE DISCS
The Richardson Co.

VALVES
The Brown Instrument Co
Cooper Alloy Foundry Co
Crane Co.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Minneapolis-Honeywell Co.
Ross Engineering Corp.
Shartle Brothers Machine Co..
Trimbey Machine Works
Walworth Co.

VENTILATING SYSTEMS
J. O. Ross Engrg. Corp

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
Fibre Making Processes, Inc
Improved Paper Mchy. Corp
E. D. Jones & Sons Co.
Moore & White Co.
Oliver United Filters Inc
Swenson Evaporator Co.
Traylor Engrg. & Mfg. Co.

WAXING MACHINERY
Potdevin Machine Co.
Waldron, John, Corp.
Shartle Brothers Machine Co..
Strachan & Henshaw, Ltd.
Weber, Herman G.

WAX SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
National Oil Products Co.
Paper Makers Chemical Corp

WELDING
S. Morgan Smith

WHEATSTONE BRIDGES
Leeds & Northrup Company

WET MACHINES
Downingtown Mfg. Co.
Improved Paper Mchy. Corp
Montague Machine Co.
Smith & Winchester Mfg. Co
Valley Iron Works Co.

WINDERS & REWINDERS
Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Langston Co., Samuel M.
Moore & White Co.
Potdevin Machine Co.
Smith & Winchester Mfg. Co
The Textile Finishing Machy Co.
John Waldron Corp.

WIRES
Appleton Wire Works
Improved Paper Mchy. Corp
International Wire Works
Lindsay Wire Weaving Co
Purves Machine Wire Co., Inc

WIRE CLEANERS
Magnus Chemical Co

WIRE CLOTH
International Nickel Co
Oliver United Filters, Inc.

WIRE GUIDES
Gilbert & Nash Co.
Moore & White Co.
John Waldron Corp.

WIRE GUIDE ROLLS
American Wringer Co.
Goodrich Rubber Co., B. F
Stowe-Woodward, Inc.

WIRE STRETCH ROLLS
American Wringer Co.
Stowe-Woodward, Inc.
Valley Iron Works Co

WOOD SPLITTERS
D. J. Murray Mfg. Co
Moore & White Co.

WOOD TANKS
G. Woolford Wood Tank Mfg

WORMED CUTTERS
American Wringer Co.
The Cincinnati Rubber Mfg Co.
Stowe-Woodward, Inc.

WRENCHES
Walworth Co.

WRENCHES (Ratchet))
Greene, Tweed & Co.

ZINC DUST
New Jersey Zinc Co.

ZINC OXIDE PIGMENT
New Jersey Zinc Co.

ZINC SULPHIDE PIGMENT
Krebs Pigment & Color Corp
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Krebs Pigment & Color Corp. .. —
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Langston Co., Samuel M. 47
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Lindsay Wire Weaving Co. ... 47
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Magnus Chemical Co. ..... —
Manhattan Rubber Co. ..... —
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Merrick Scale Co. ..... —
Michigan Steel Casting Co. ... 52
Mine & Smelter Supply Co. 49
Montague Machine Co. ..... —
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Morse Chain Co. ..... —
Mt. Vernon-Woodberry Mills, Inc. —
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Murray Mfg. Co., D. J. ..... —
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Nashville Bridge Co. 52
National Aniline & Chemical Co. —
National Oil Products Co. .. —
New Jersey Zinc Co. ..... —
New York Color & Chemical Co. —
Noble & Wood Machine Co. ... —
Norton Company ..... —
Norwood Engineering Co. ..... —
Oliver United Filters Co. ..... —
Orr Felt & Blanket Co. ..... —
Paper Converting Machy. Co. .... —
Paper Makers Chemical Co. .... —
Paper Makers Importing Co. 4
Pennslyvania Salt Mfg. Co. .... —
Perkins-Goodwin Co. ..... —
Perkins & Sons, Inc., B. F. .... —
Philadelphia Quartz Co. ..... —
Portable Light Co., Inc. ..... —
Potdevin Machine Co. 6
Price & Pierce, Ltd. 6
Propellair, Inc. ..... —
Purves Machine Wire Co. 52
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Rhoads Sons, J. E. ..... —
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Standard Oil Co. of Indiana ... —
Stebbins Engrg. & Mfg. Co. .... —
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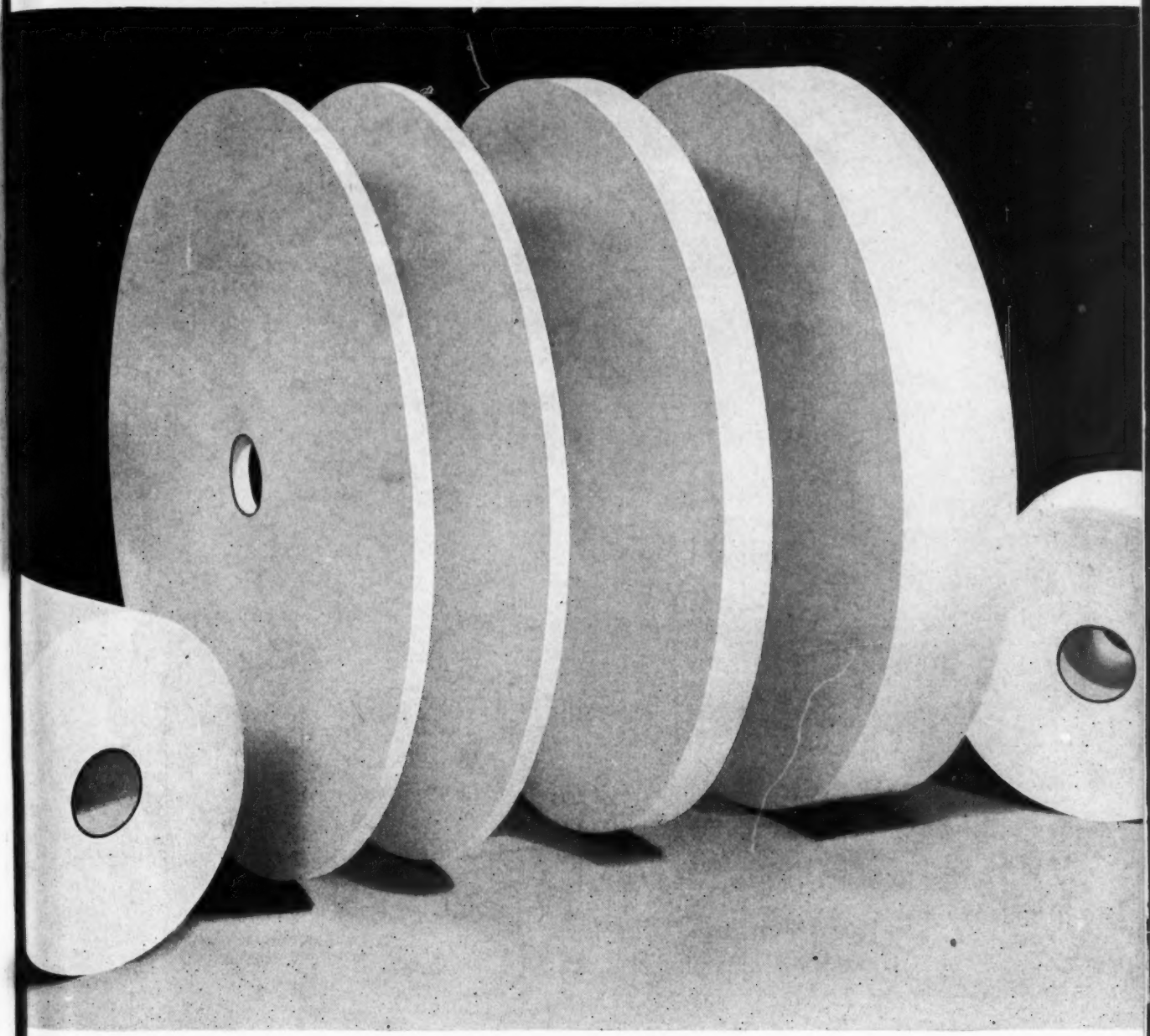
Wilkens-Anderson Co. ..... —
Williams Apparatus Co. ..... —
Williams & Co., C. K. ..... —
Woods Sons Co., T. B. ..... —
Woolford Wood Tank Mfg. Co. —
Worthington Pump & Machinery Corp. ..... —
Wyckoff & Sons, A. ..... —

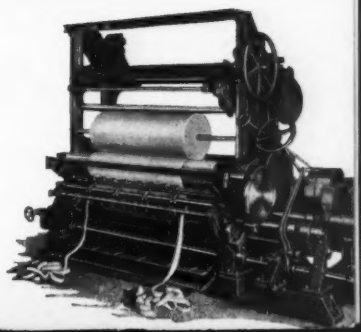
See pages 54, 55, 56 and 57 Classified List of Products and heir Manufacturers.

LANGSTON SLITTERS



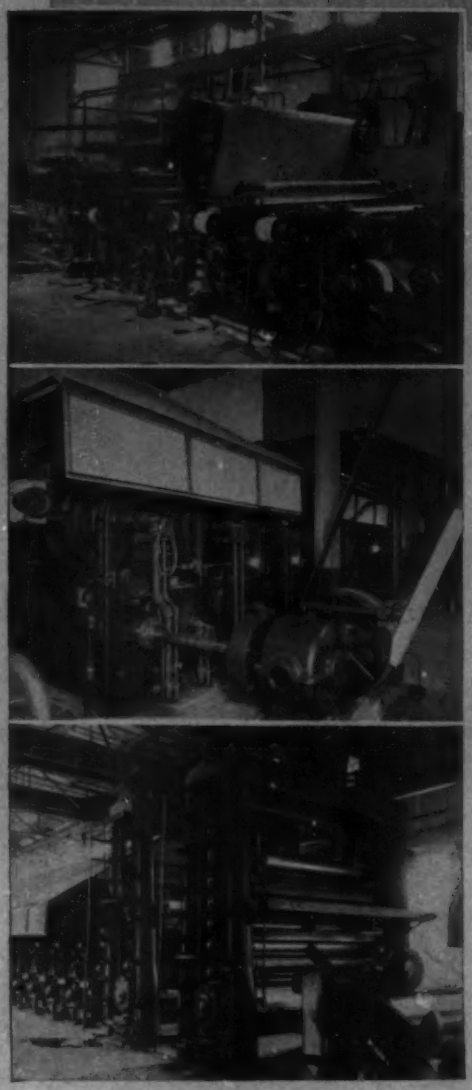
AND ROLL WINDERS

THESE thirty-inch diameter rolls of Hammermill Bond were produced on a Langston Type "AA" Slitter. Note the uniform density from core to outside and the clean, square-edged cut on the ¾" as well as the larger rolls. A Shear-Cut is a Clean Cut.



SAMUEL M. LANGSTON COMPANY
CAMDEN, NEW JERSEY

TIMKEN-EQUIPPED
FROM WET END TO CALENDER STACK



Built by Beloit Iron Works, Beloit, Wisconsin. Completely Timken-equipped.

TIMKEN BEARING EQUIPPED

Here is a typical example of a modern anti-frictionized paper machine. All rolls—wire rolls, breast rolls, felt rolls, press rolls, couch rolls, dryer rolls and calender rolls are mounted on Timken Bearings. Results — faster, smoother operation; lower power consumption; simplified lubrication; more dependable performance; reduced maintenance cost; and extended machine life.

The Timken Bearing is ideally adapted to all kinds of paper mill equipment because it combines the ability to successfully combat the severest attacks of radial, thrust and combined loads with the close radial running accuracy necessary to hold moving parts in precision relationship to within a few thousandths of an inch.

It will pay you to see that you get Timken Bearings in any new equipment you buy, including beaters, shredders, Jordan engines, pulp machines, paper machines and super calenders.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *TAPERED ROLLER* BEARINGS